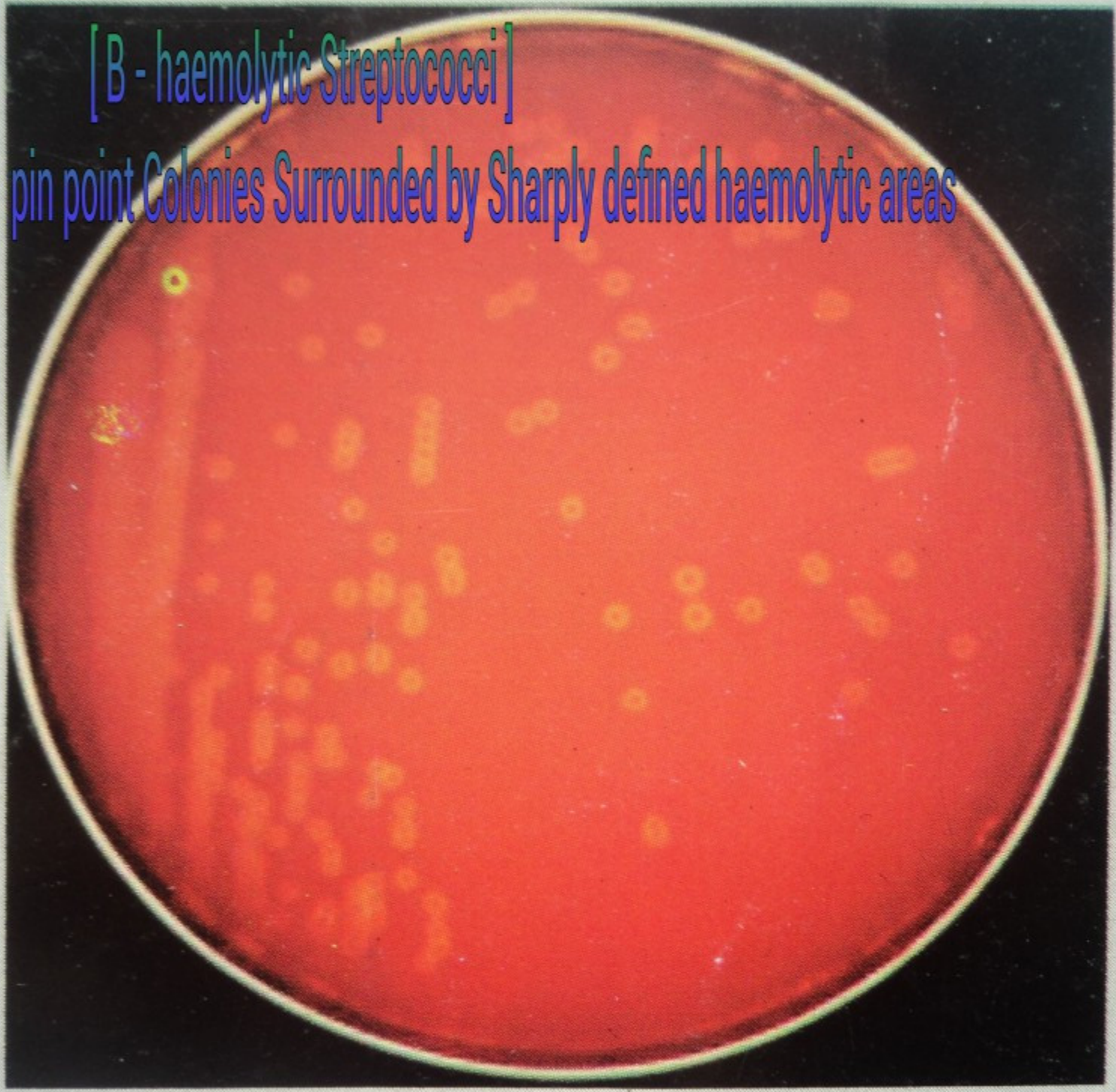

[Non haemolytic Staphylococcus]
white non haemolytic Colonies On Sheep blood agar


[B haemolytic Staphylococcus]
Yellow Colonies Surrounded by B haemolytic Zones on Sheep blood agar

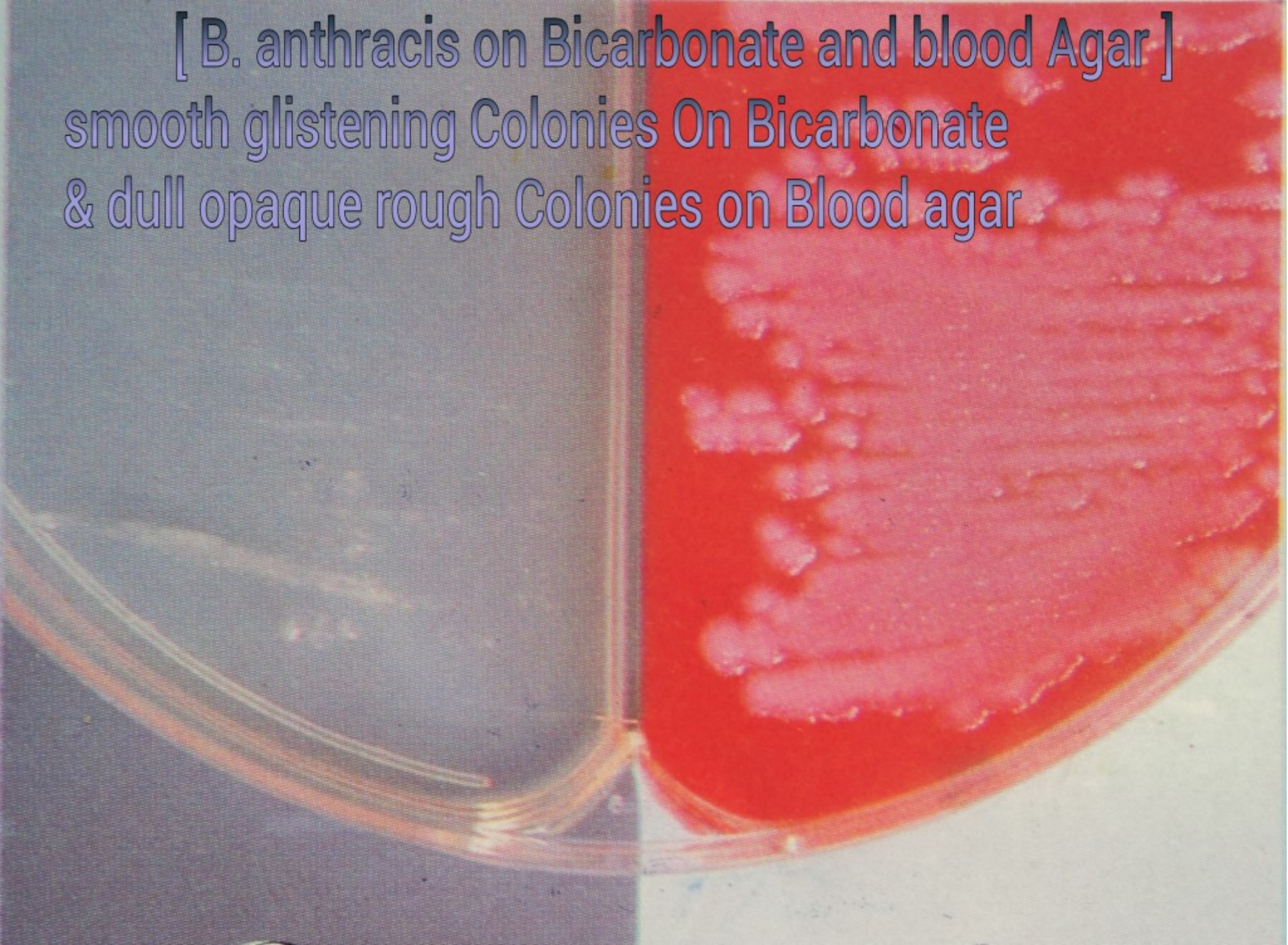

[mannitol Salt agar for Staphylococci]
Selective → 7.5% Salt
differential → mannitol Sugar
indicator → phenol red
S. Aureus → ferment mannitol and Cause Phenol red to turn Yellow


[Streptococcus equi]
alpha haemolysis
H2S production + iron → iron Sulphide [Black]


S, Viridans [a haemolytic Streptococci]
Colonies Surrounded by narrow Green Zones
H2O2 + haemoglobin → met haemoglobin [green]


[B - haemolytic Streptococci]
pin point Colonies Surrounded by Sharply defined haemolytic areas


[Enterococcus agar for E. fecalis]
Contain Sodium azide → inhibit gram -ve bacteria
tetrazolium chloride reduced to formazon [red]


[B. anthracis on Bicarbonate and blood Agar]
smooth glistening Colonies On Bicarbonate
& dull opaque rough Colonies on Blood agar


[B. anthracis Mucoid Colonies]
Mucoid Colonies occur due to production of Capsule


[B. Cereus]
Colonies with Wide Zone of B haemolysis on Blood agar


[B. Subtilis]
narrow Zone of B haemolysis

B. Cereus [BCSA → Bacillus Cereus Selective agar]

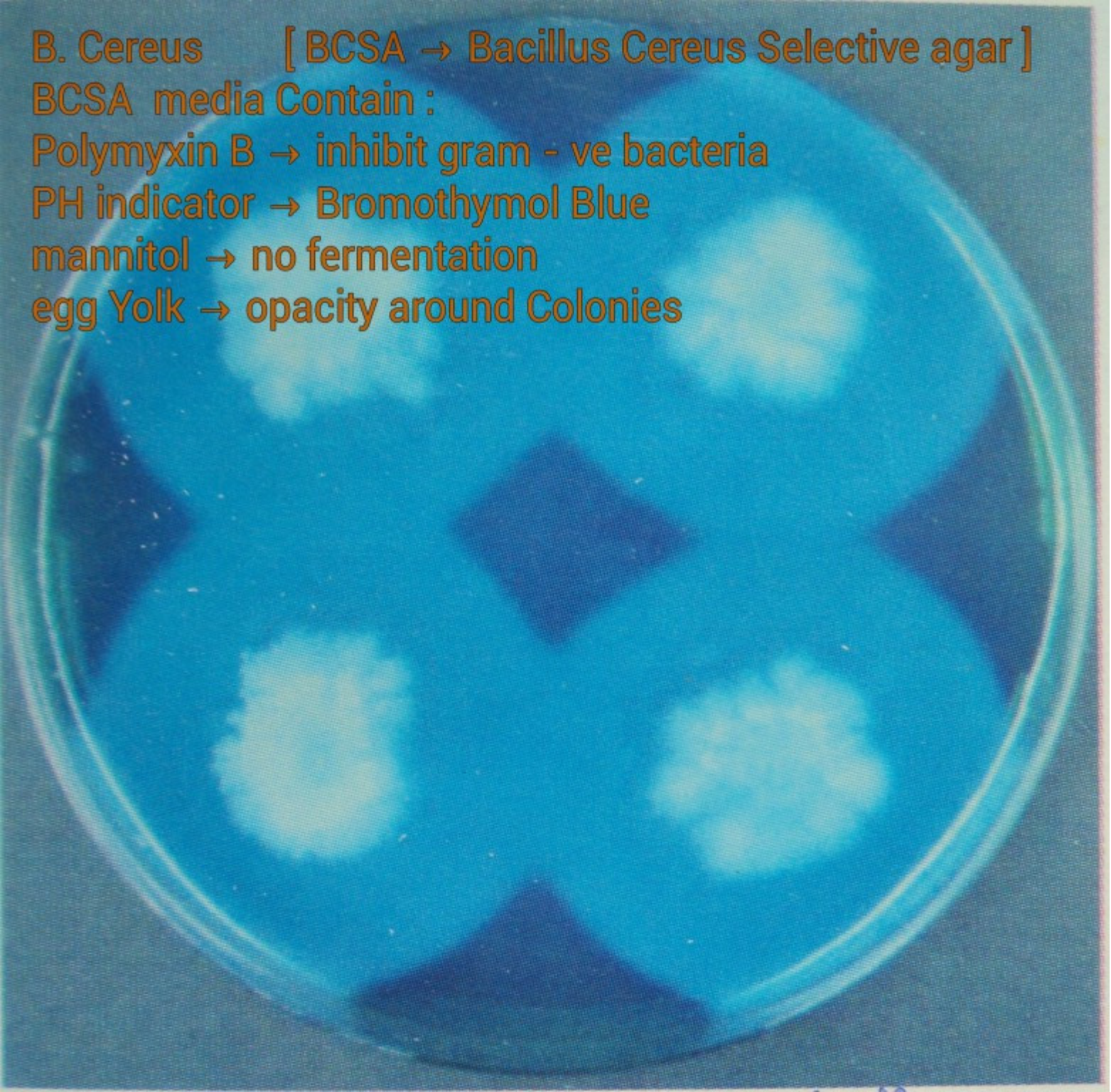
BCSA media Contain :

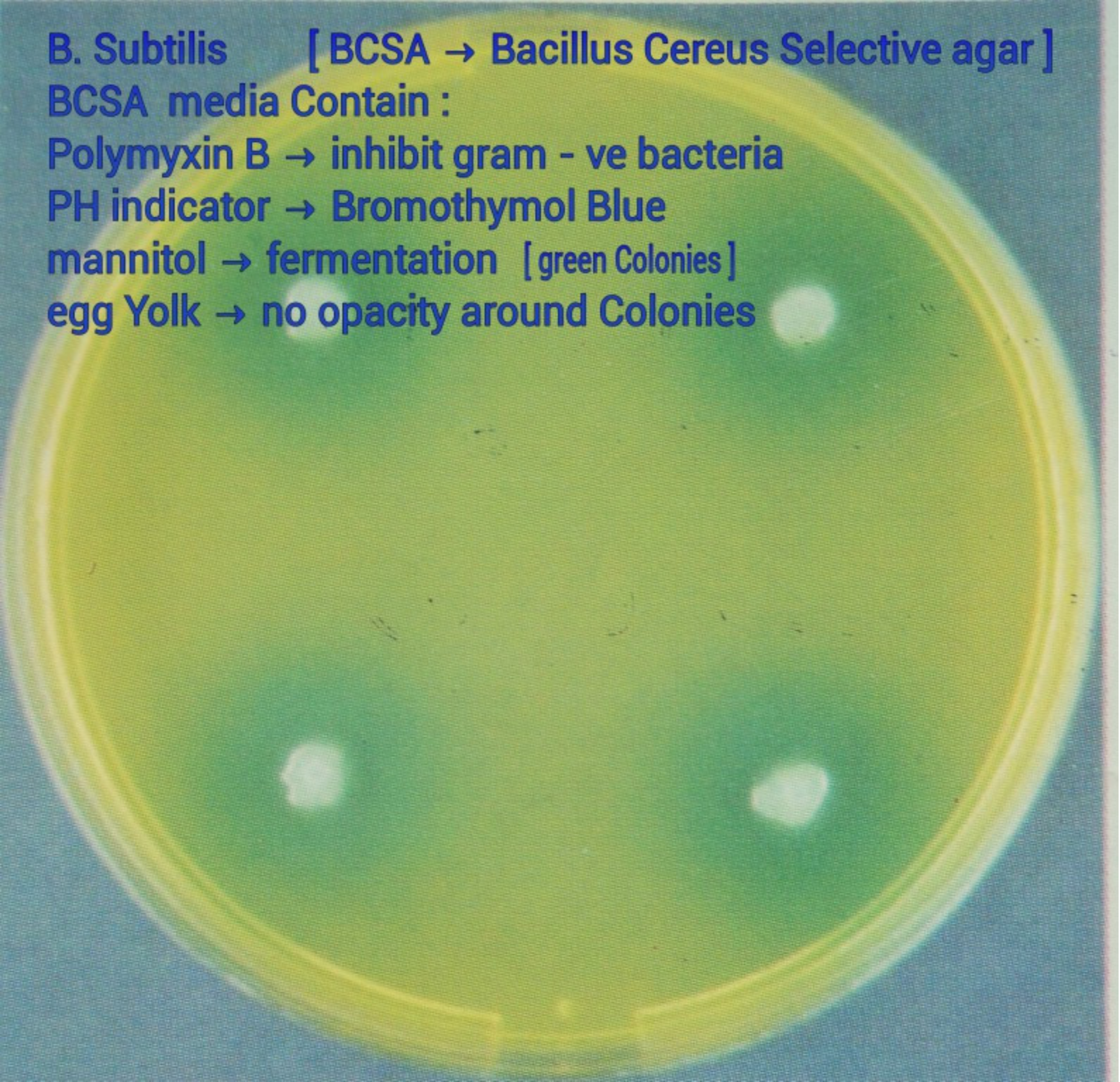
Polymyxin B → inhibit gram - ve bacteria

PH indicator → Bromothymol Blue

mannitol → no fermentation

egg Yolk → opacity around Colonies

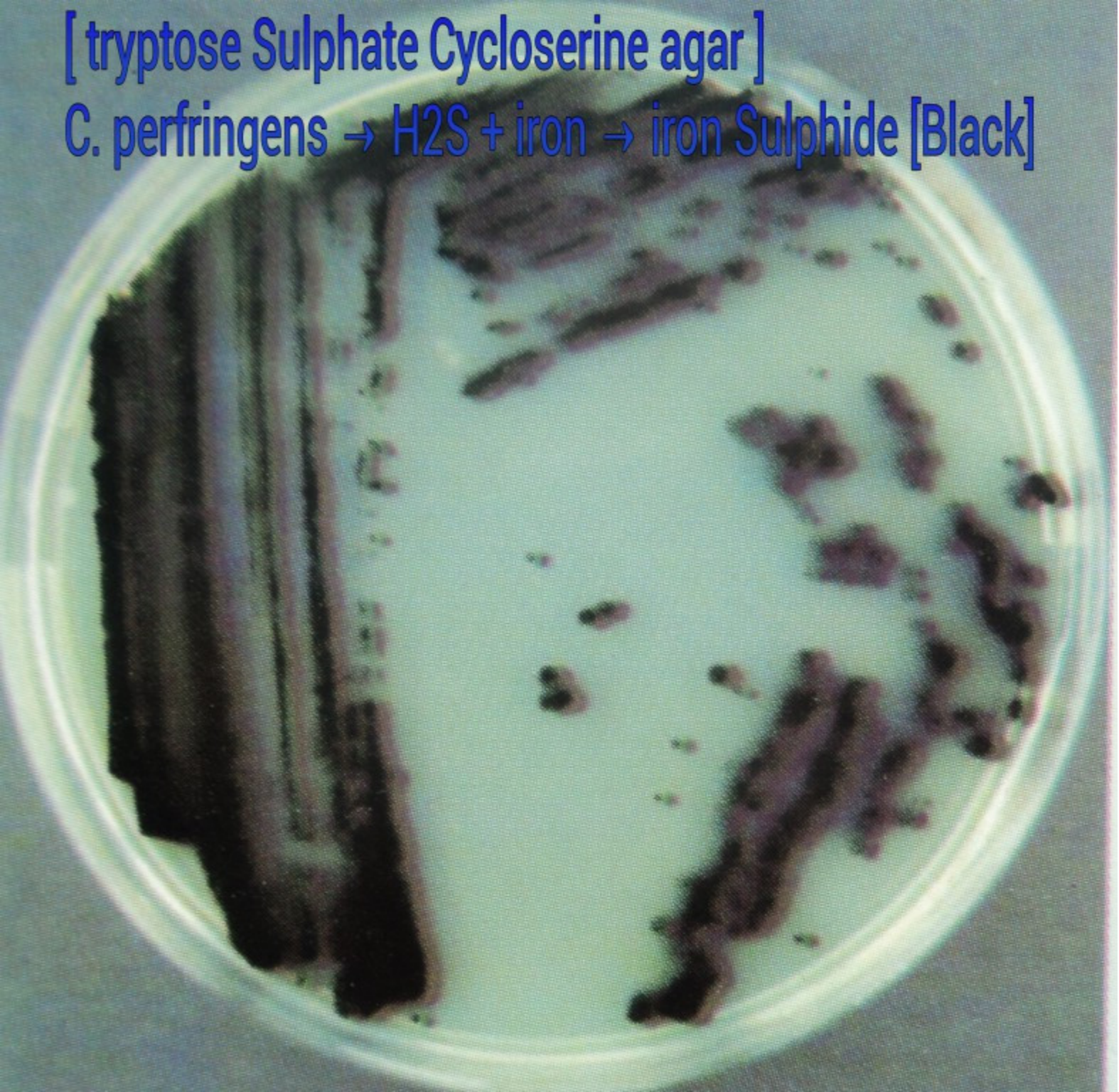


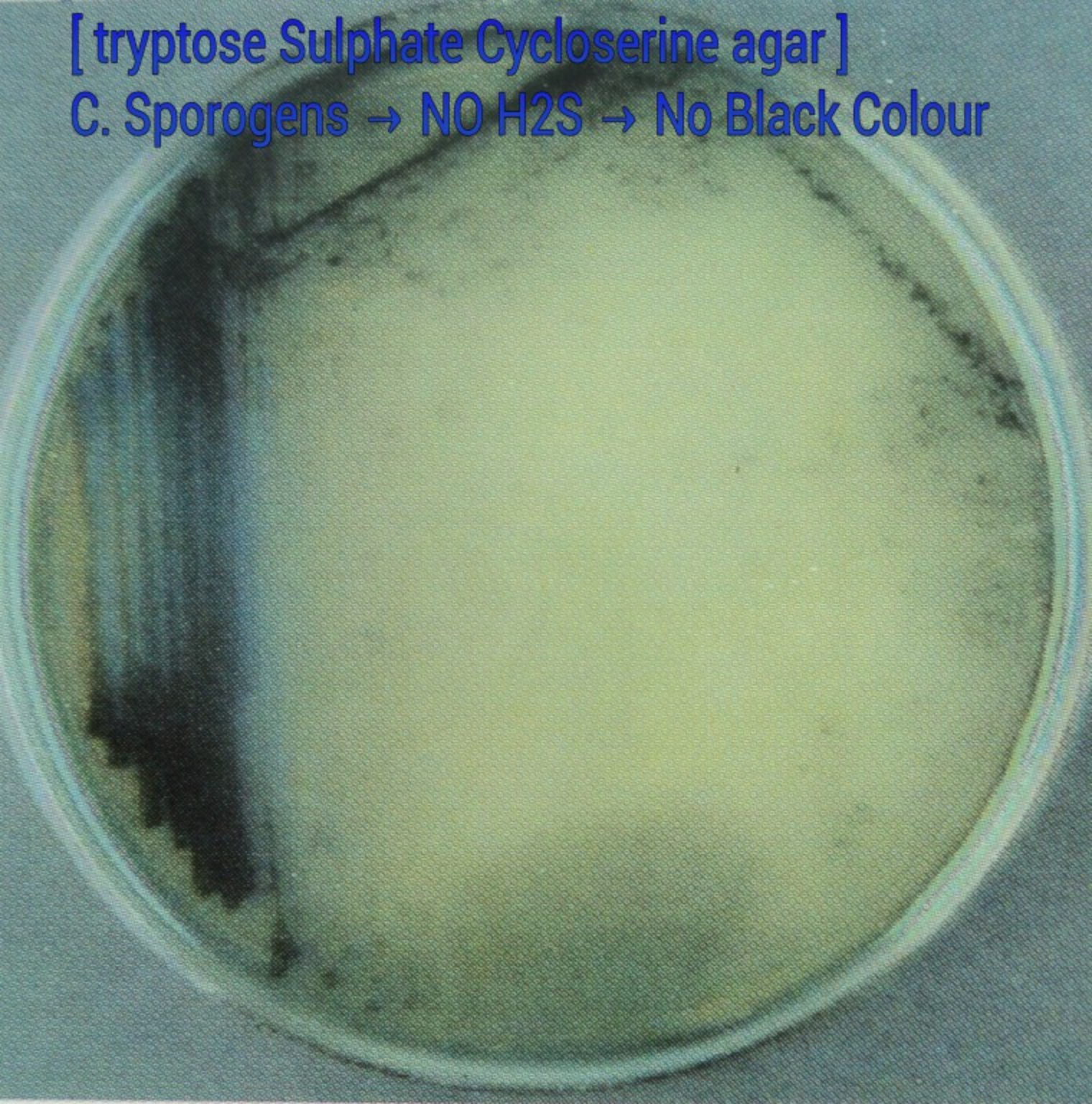

B. Subtilis [BCSA → Bacillus Cereus Selective agar]
BCSA media Contain :
Polymyxin B → inhibit gram - ve bacteria
PH indicator → Bromothymol Blue
mannitol → fermentation [green Colonies]
egg Yolk → no opacity around Colonies


[C. perfringens On Blood agar]
Colonies Surrounded by Two Zones of haemolysis
inner → Complete haemolysis due to Theta toxin release
outer → partial haemolysis due to a- Toxin release

[tryptose Sulphate Cycloserine agar]

C. perfringens → H2S + iron → iron Sulphide [Black]




[tryptose Sulphate Cycloserine agar]
C. Sporogens → NO H2S → No Black Colour

[Oxford agar for listeria SPP]

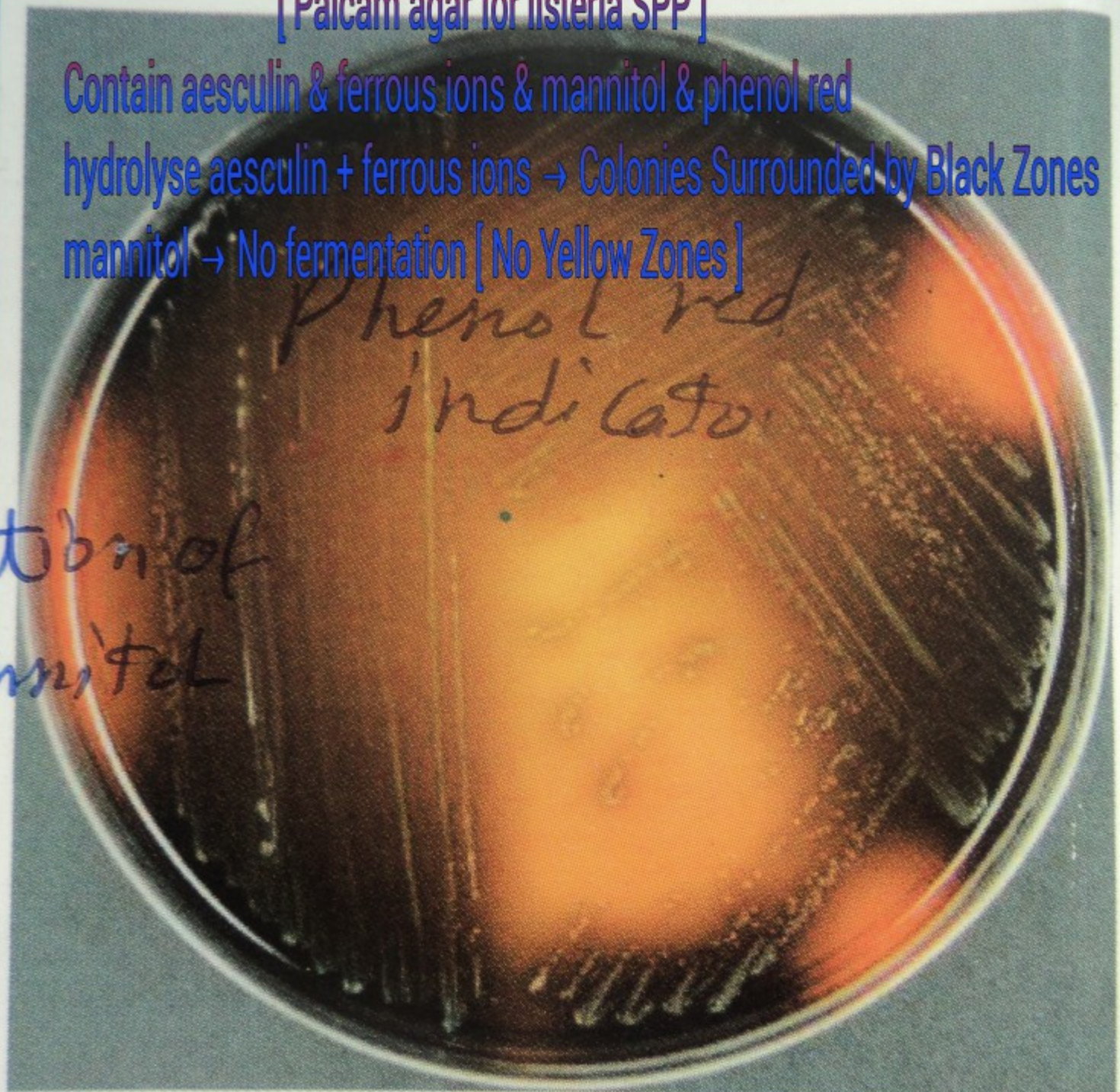
listeria hydrolyse aesculin+ ferrous ions → Black Zones under and arround Colonies

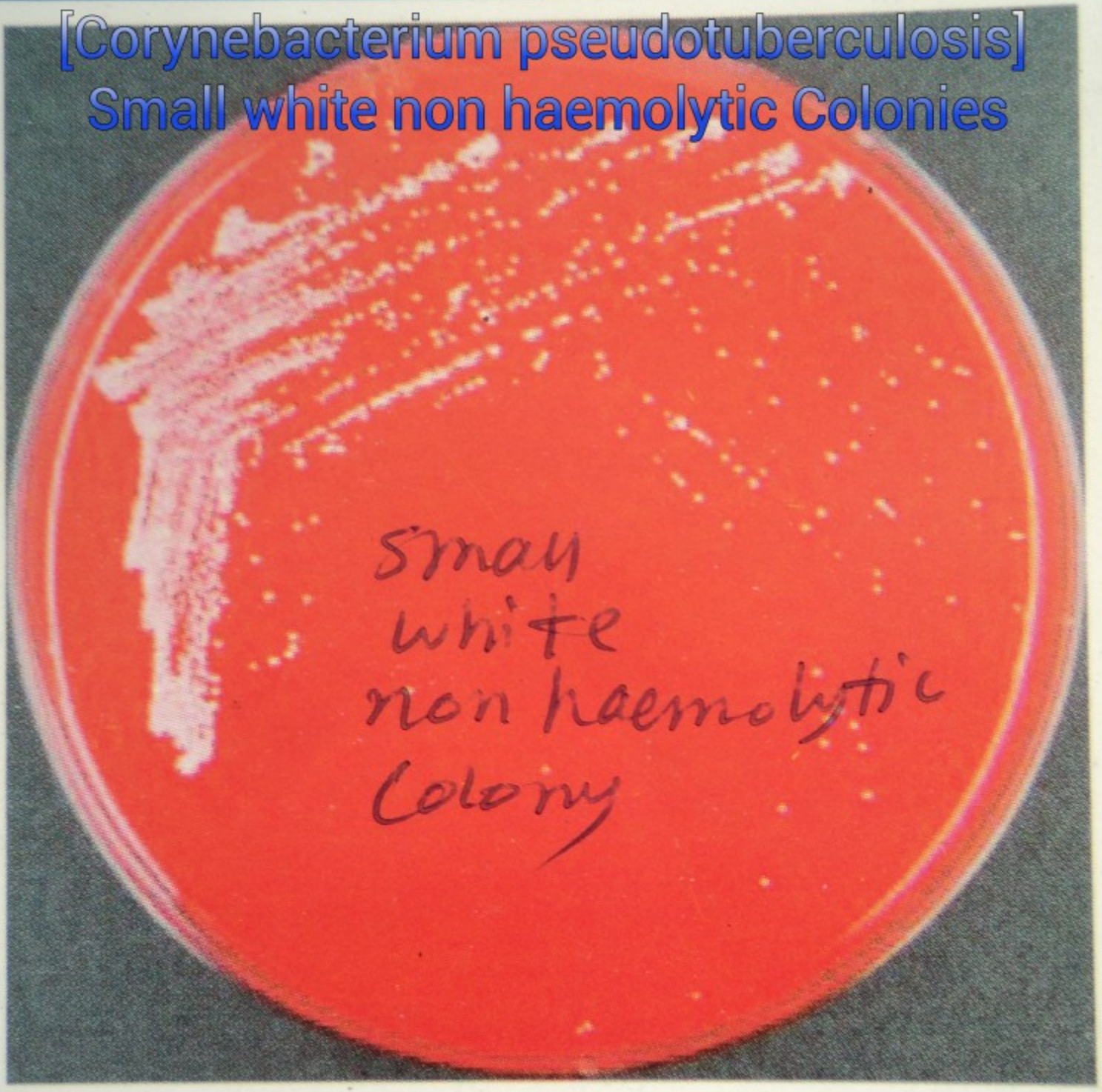
[Palcam agar for listeria SPP]

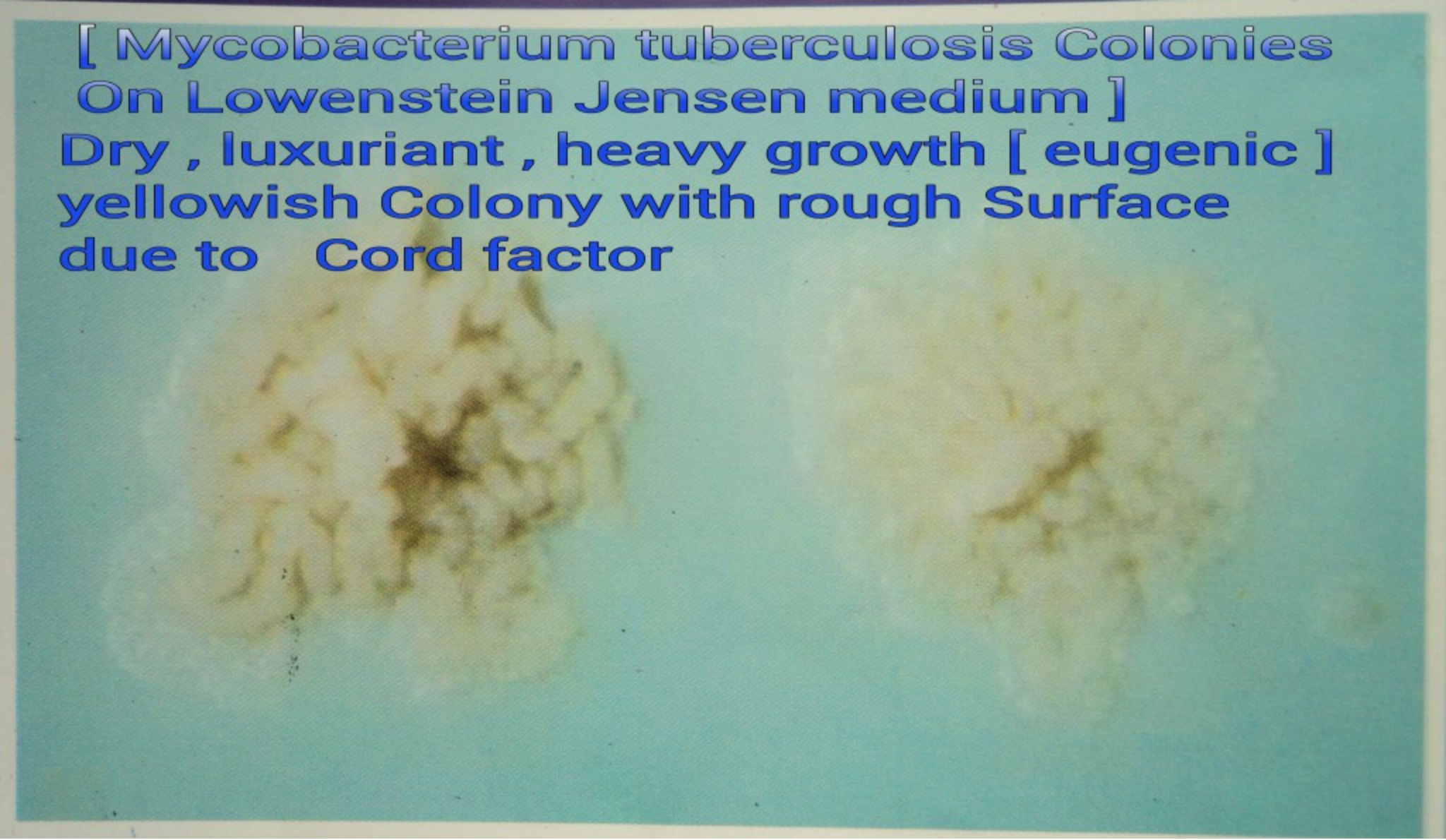
Contain aesculin & ferrous ions & mannitol & phenol red

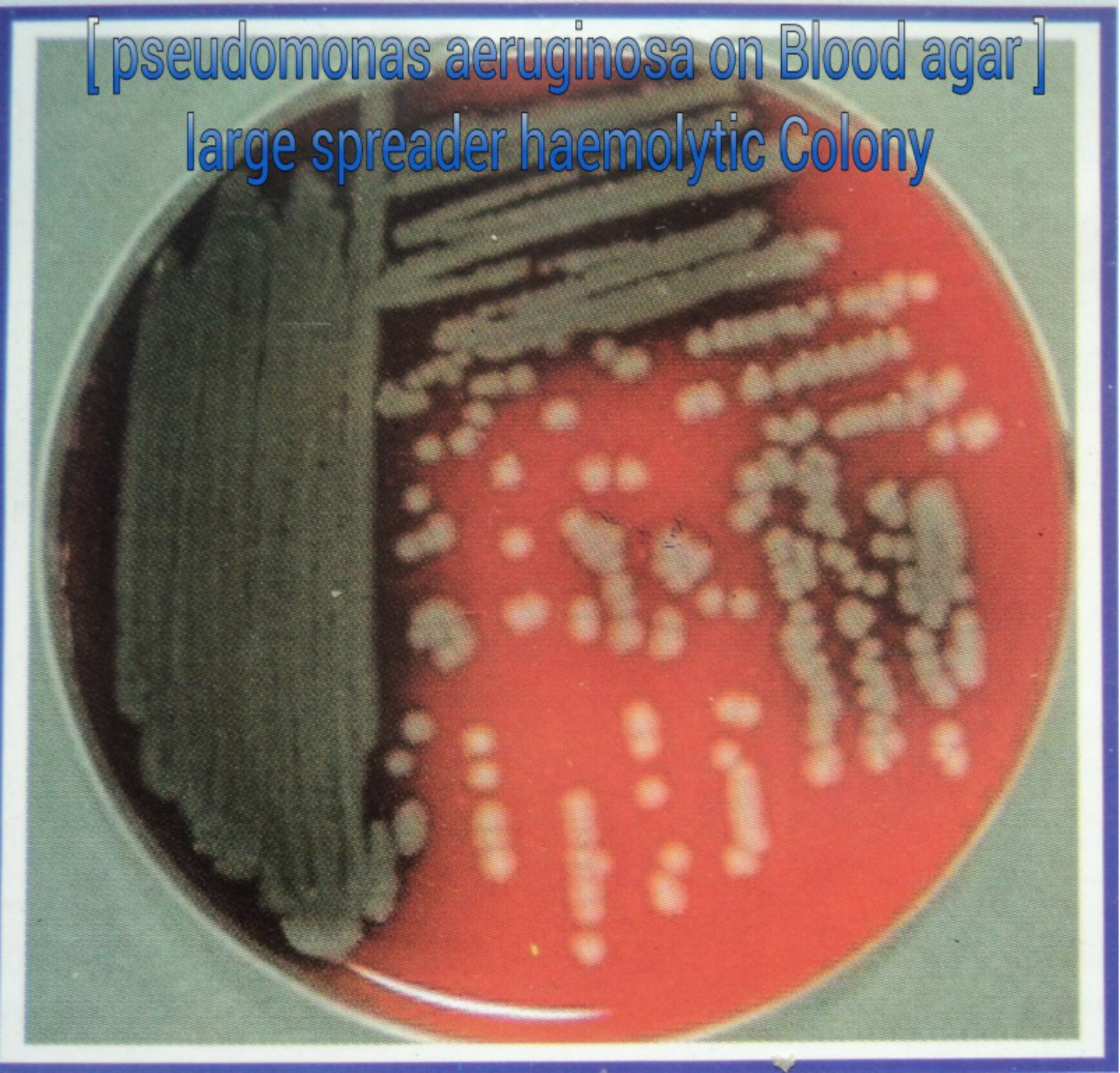
hydrolyse aesculin + ferrous ions → Colonies Surrounded by Black Zones

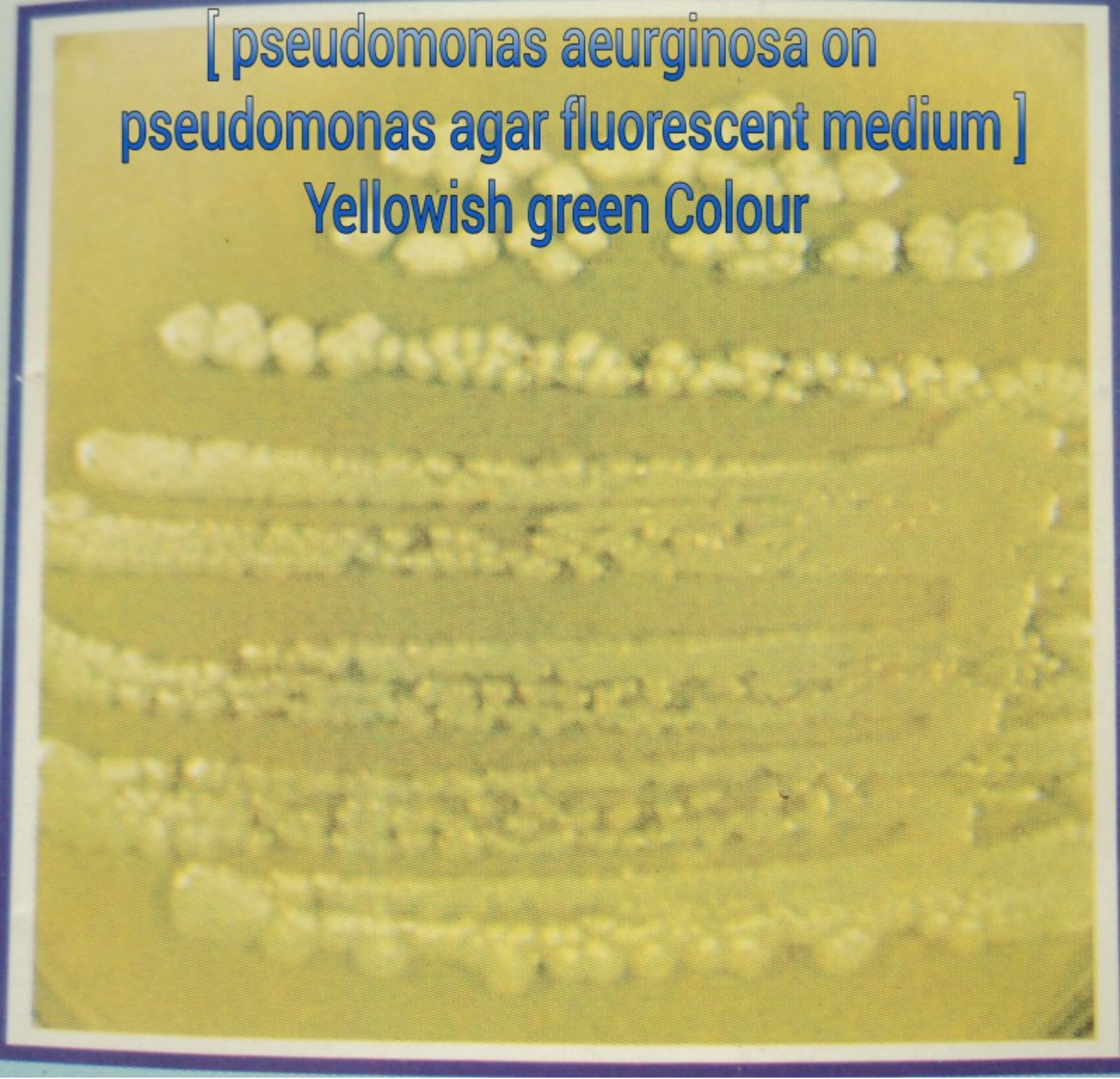
mannitol → No fermentation [No Yellow Zones]




[Corynebacterium pseudotuberculosis]
Small white non haemolytic Colonies
Small
white
non haemolytic
Colony


[Mycobacterium tuberculosis Colonies
On Lowenstein Jensen medium]
Dry , luxuriant , heavy growth [eugenic]
yellowish Colony with rough Surface
due to Cord factor


[pseudomonas aeruginosa on Blood agar]
large spreader haemolytic Colony


[pseudomonas aeurginosa on
pseudomonas agar fluorescent medium]
Yellowish green Colour

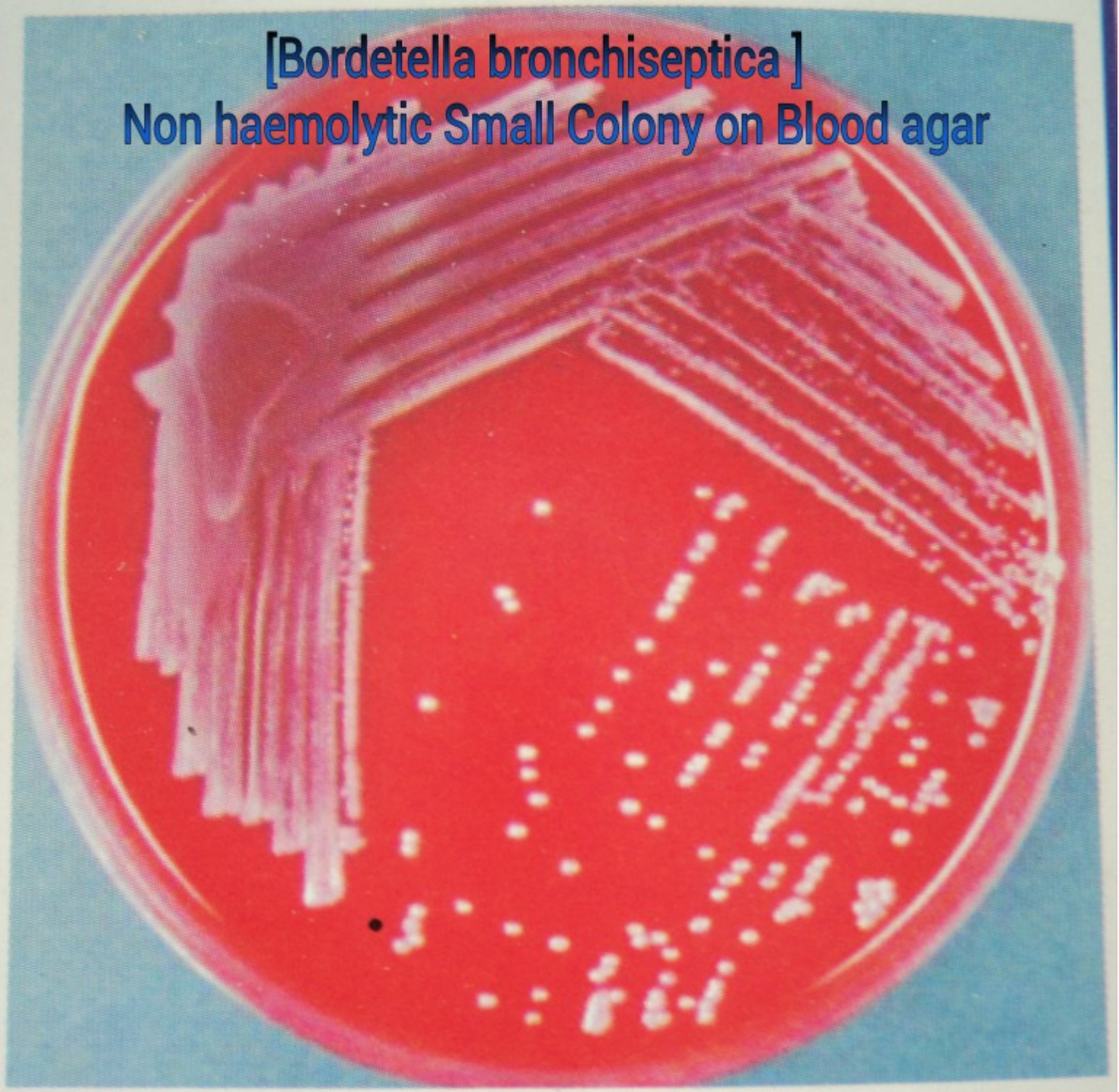

[Pseudomonas aeurginosa on
pseudomonas agar pyocyanin medium]
greenish blue Colour


[kings B agar]
pseudomonas fluorscense → Pyoverdin
media & Colony → Yellowish green


[Kings B agar]
Actinobacter → No Pigment
Colony & media → Colourless

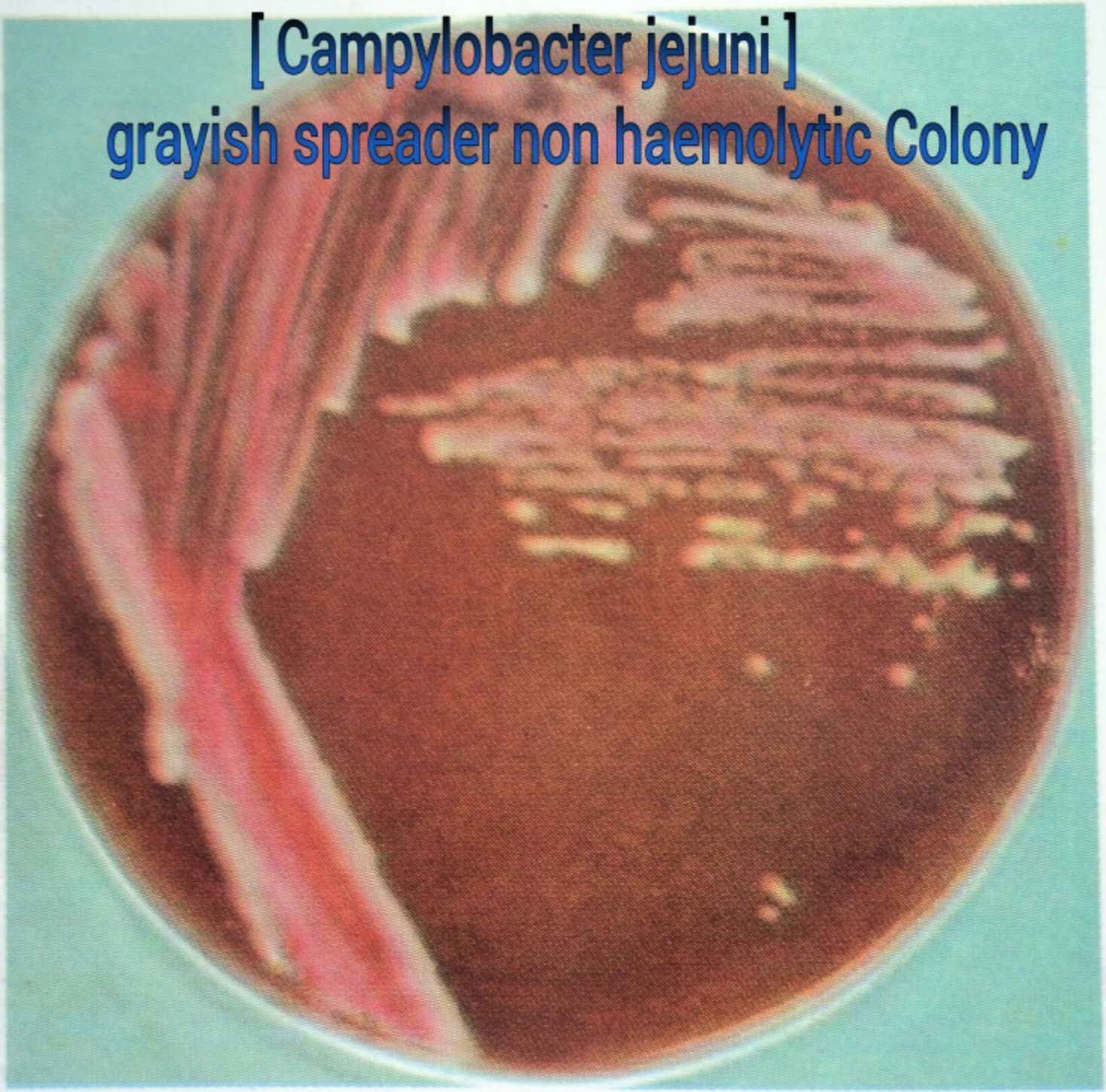

[Brucella]
non haemolytic Small Colony on Blood agar

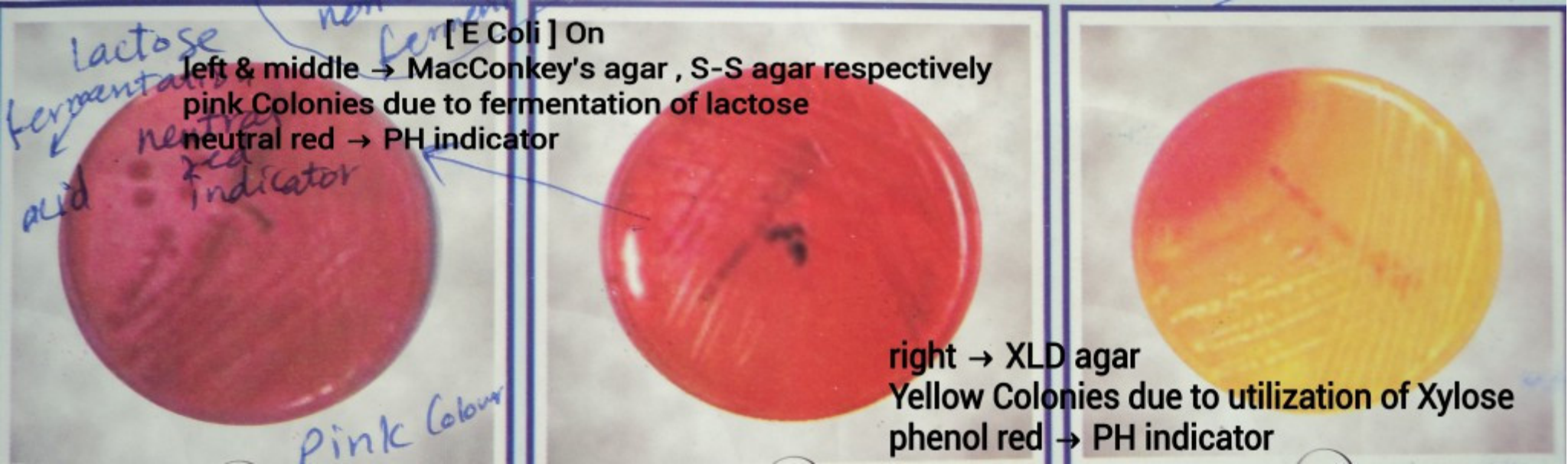
[Bordetella bronchiseptica]
Non haemolytic Small Colony on Blood agar



[Campylobacter jejuni]

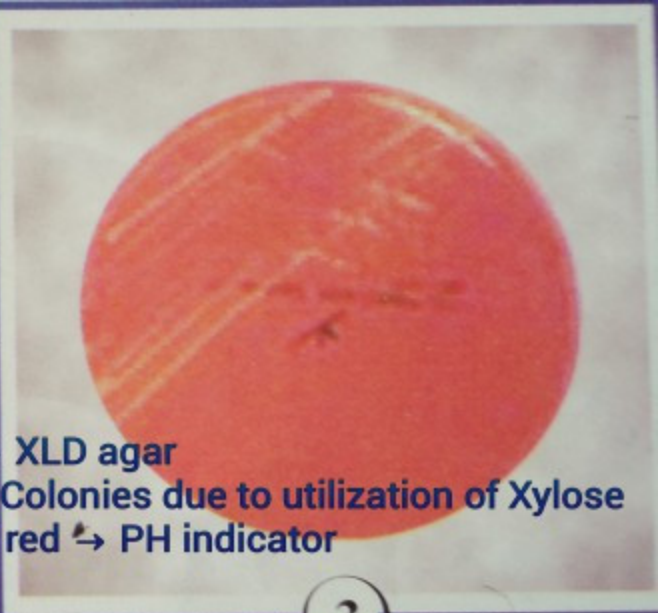
grayish spreader non haemolytic Colony




[E Coli] On
left & middle → MacConkey's agar , S-S agar respectively
pink Colonies due to fermentation of lactose
neutral red → PH indicator
right → XLD agar
Yellow Colonies due to utilization of Xylose
phenol red → PH indicator

[Klebsiella] On
left & middle → MacConkey's agar , S-S agar respectively
Pink Colonies due to fermentation of lactose
neutral red →PH indicator

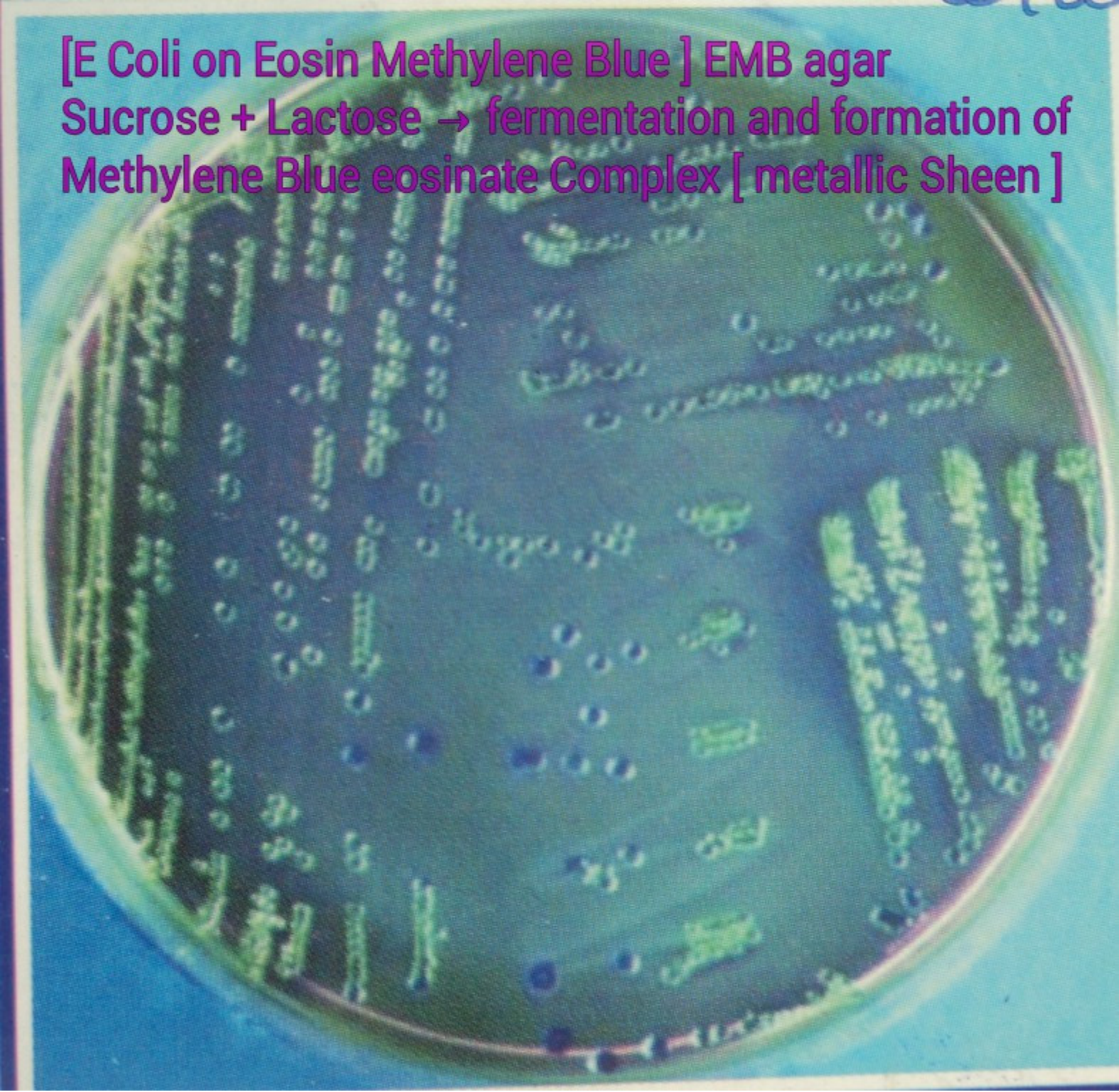
right → XLD agar
Yellow Colonies due to utilization of Xylose
phenol red → PH indicator



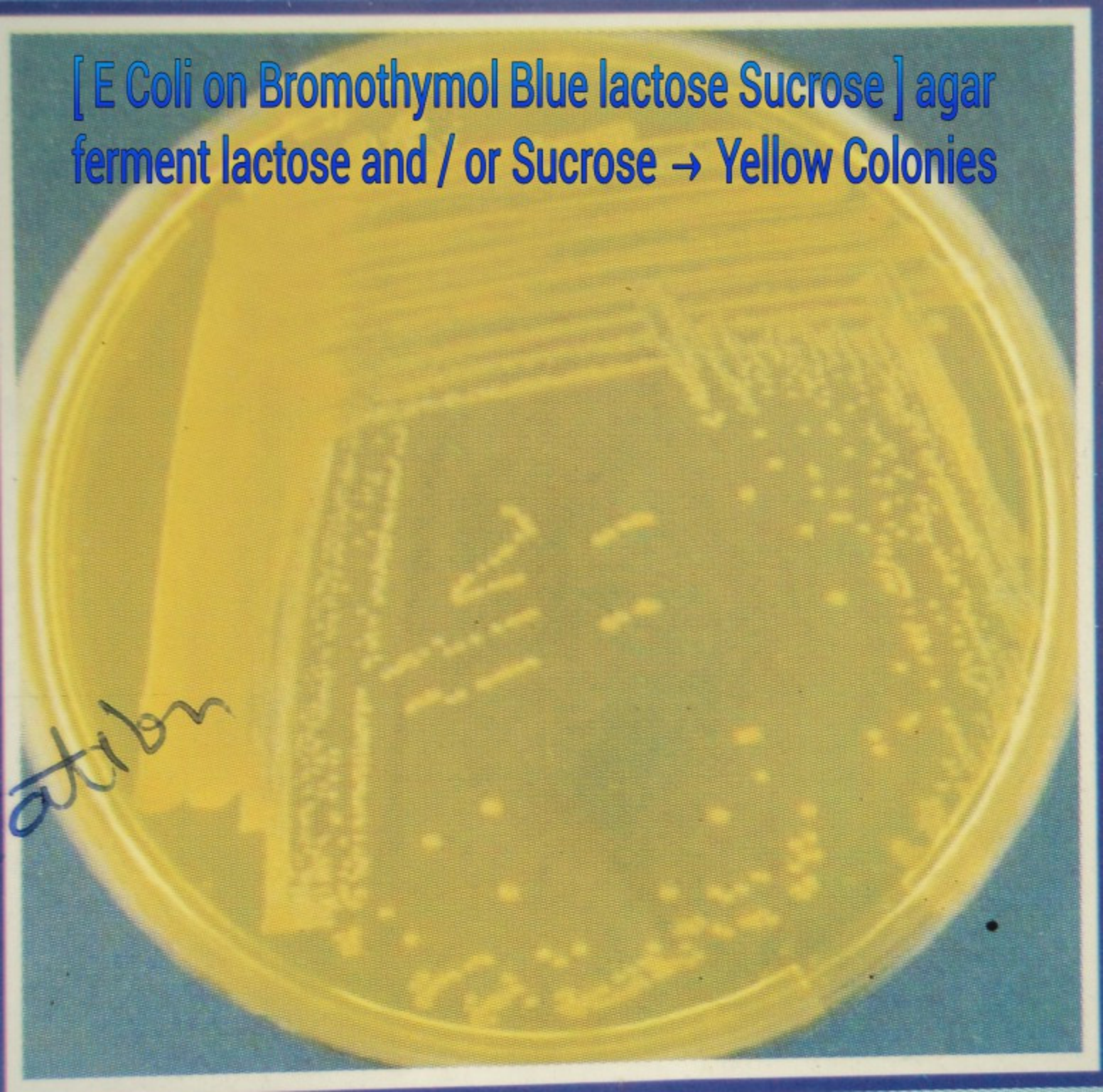
[Salmonella] On
left & middle → MacConkey's agar , S-S agar respectively
Colourless Colonies due to non lactose fermenter
Middle → H2S production + iron → Black Centers

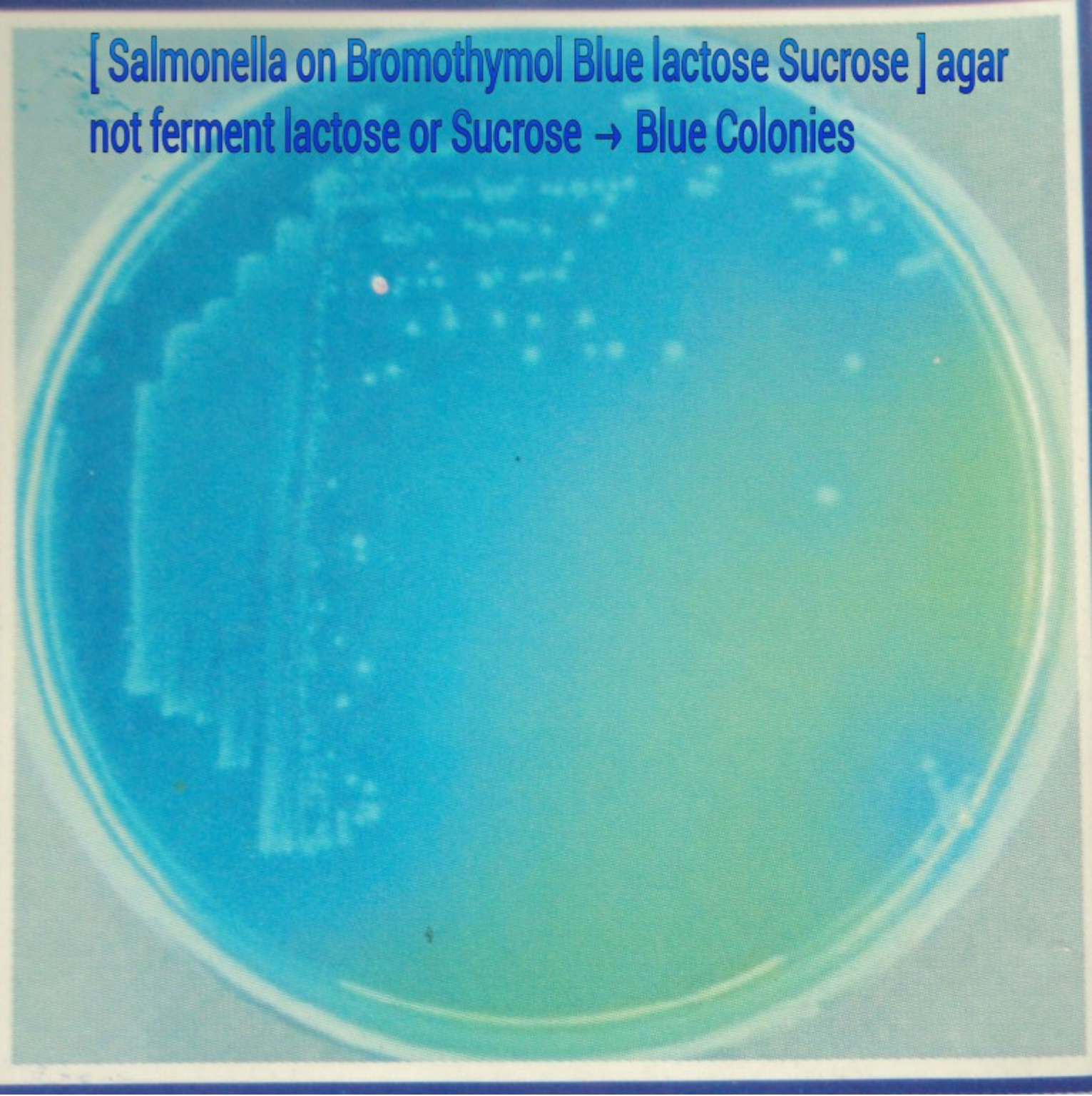
right → XLD agar
first → Yellow Colonies due to utilisation of Xylose
then → red due to decarboxylation of lysine
with black Centers due to H2S production

[E Coli on Eosin Methylene Blue] EMB agar
Sucrose + Lactose → fermentation and formation of
Methylene Blue eosinate Complex [metallic Sheen]




[Klebsiella on Eosin Methylene Blue] EMB agar
Colourless or light Purple Colonies
no Sucrose and lactose


[E Coli on Bromothymol Blue lactose Sucrose] agar
ferment lactose and / or Sucrose → Yellow Colonies


[Salmonella on Bromothymol Blue lactose Sucrose] agar
not ferment lactose or Sucrose → Blue Colonies

BPLS [Brilliant-green phenol-red lactose Sucrose] agar

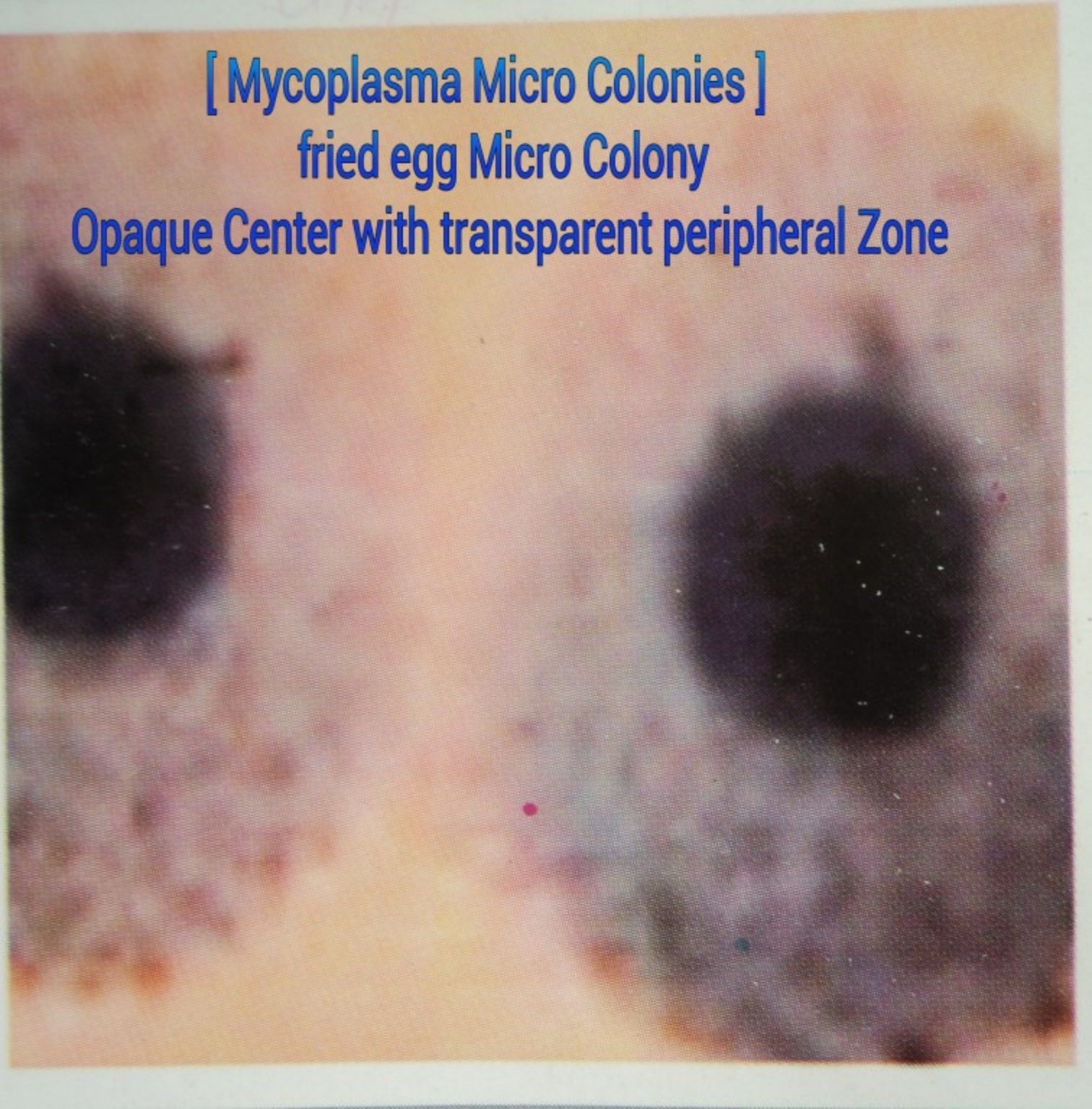
Salmonella → red Colonies due to no fermentation of Lactose or sucrose


BPLS [Brilliant-green phenol-red lactose Sucrose] agar
fermentation of lactose and / or Sucrose → Acid
→ low PH → Yellow Colonies
E Coli

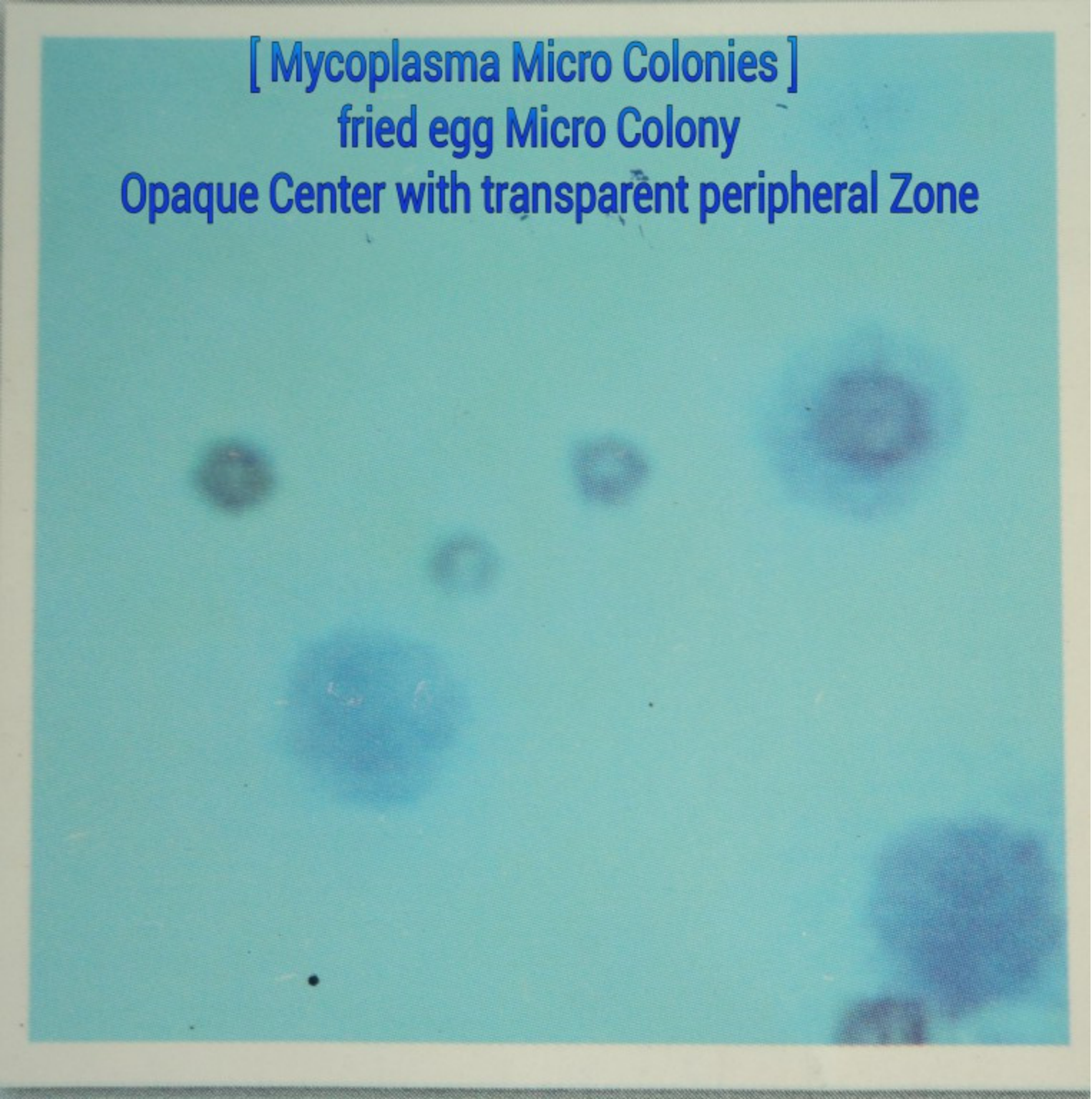

[Proteus mirabilis]
Swarming on Blood agar due to
active Motile Microorganism

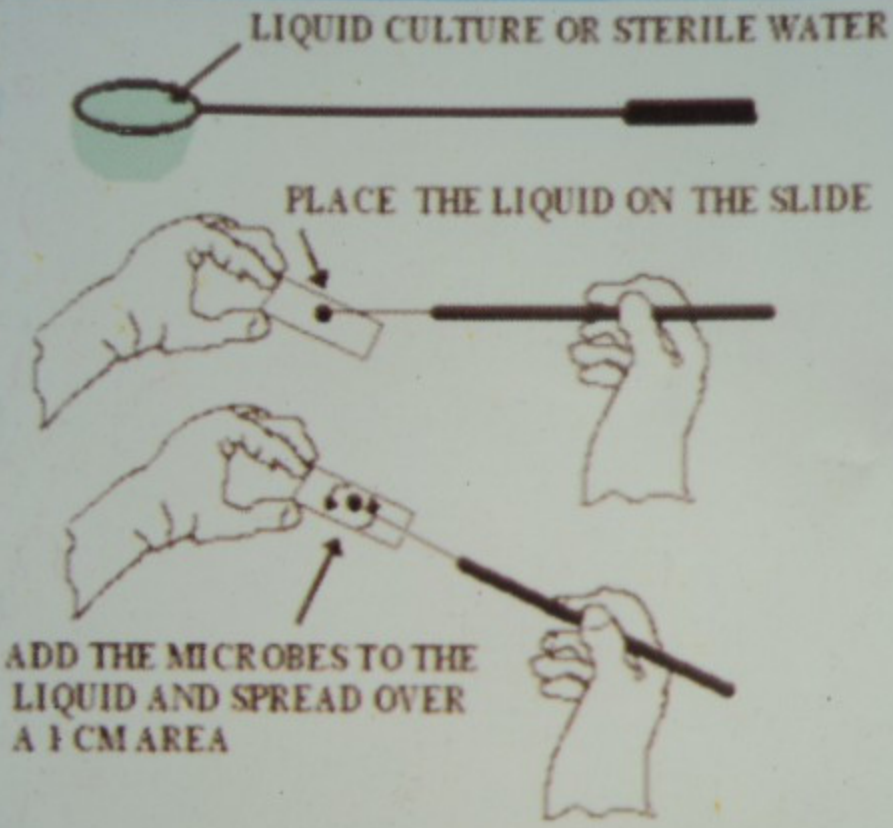

[Pasteurella Multocida]
non haemolytic white Colony
on Blood agar


[Pasteurella haemolytica]
B- haemolysis on Blood agar

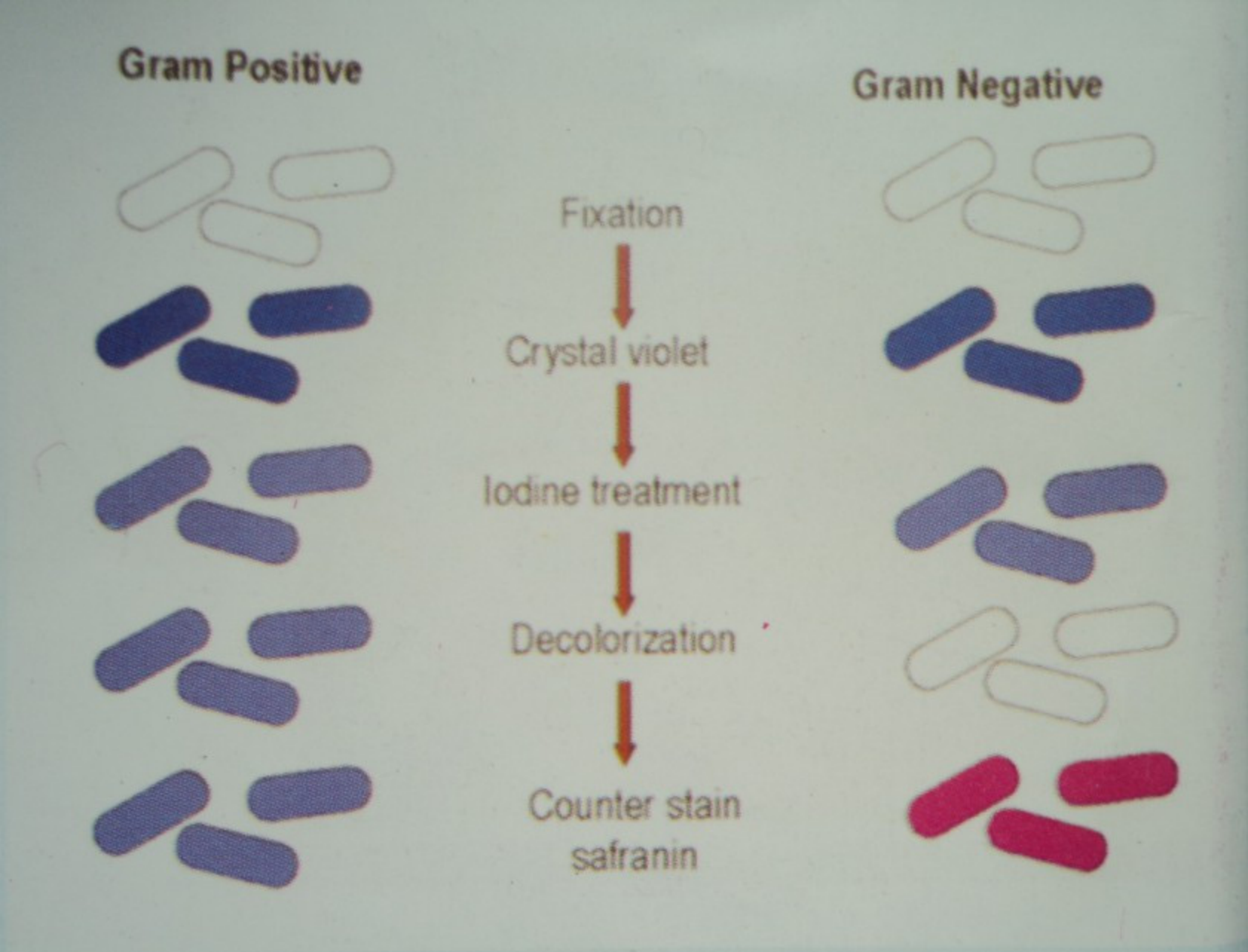

[Mycoplasma Micro Colonies]
fried egg Micro Colony
Opaque Center with transparent peripheral Zone


[Mycoplasma Micro Colonies]
fried egg Micro Colony
Opaque Center with transparent peripheral Zone

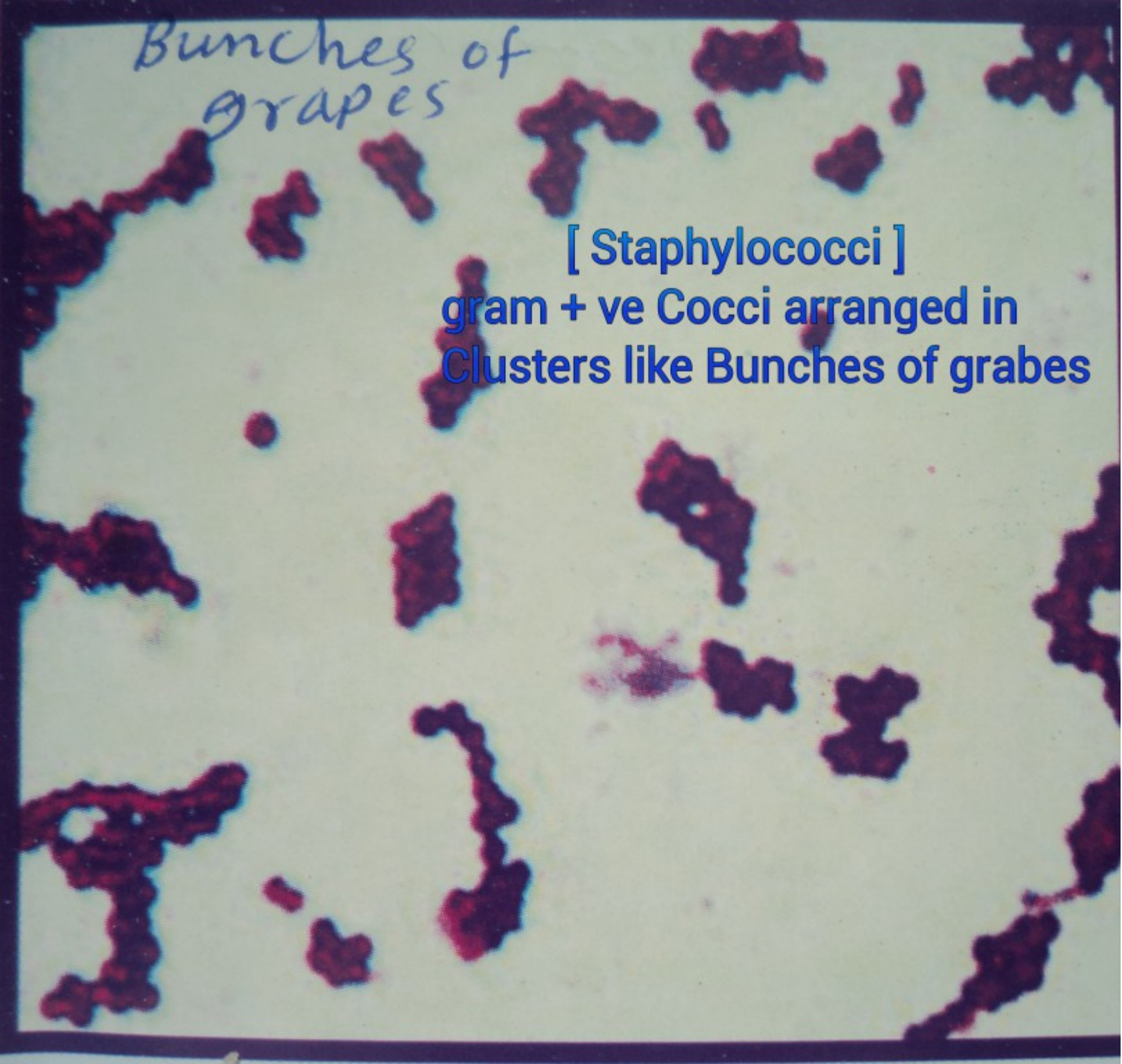

[Mycoplasma Micro Colonies]
fried egg Micro Colony
Opaque Center with transparent peripheral Zone

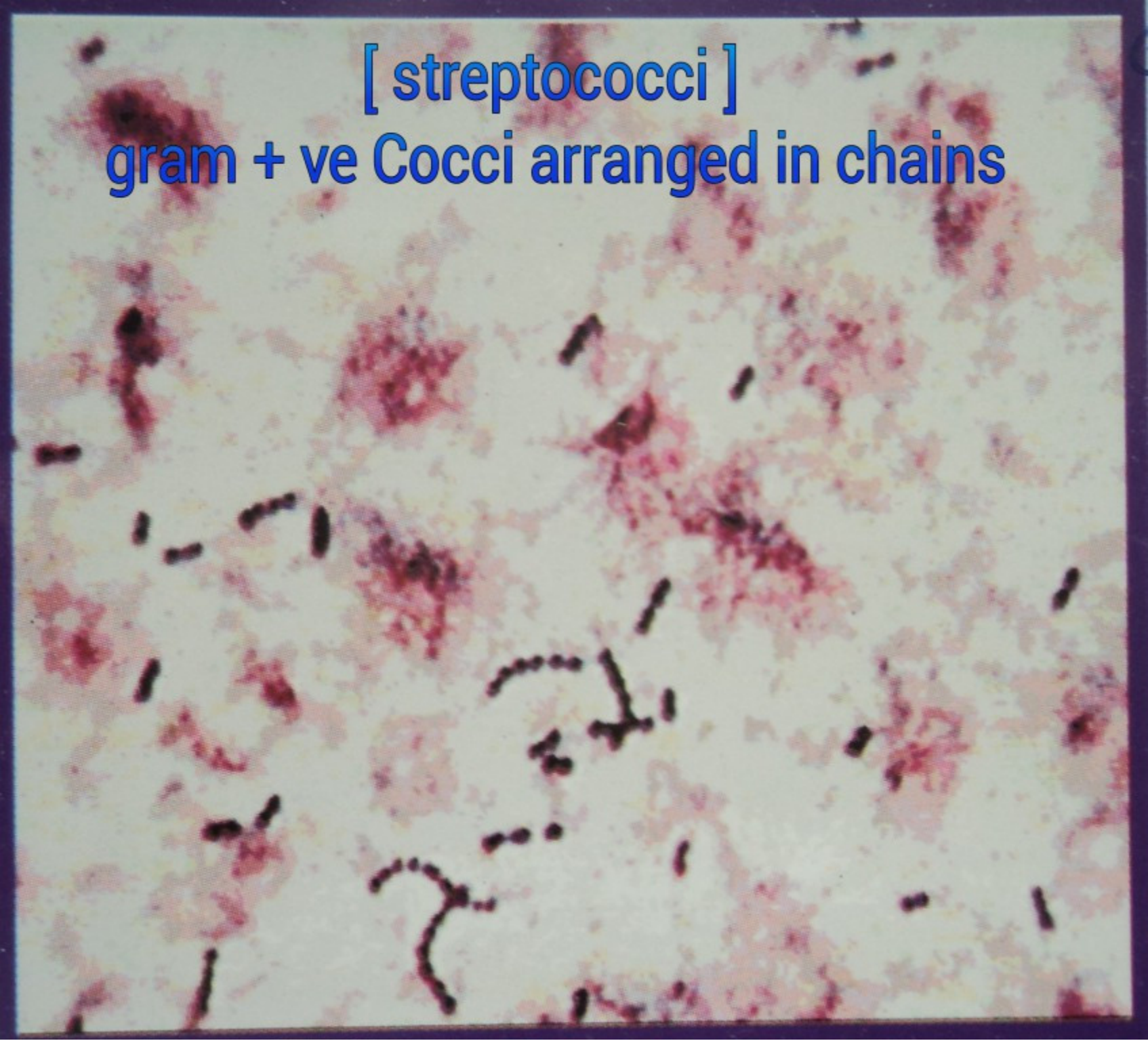


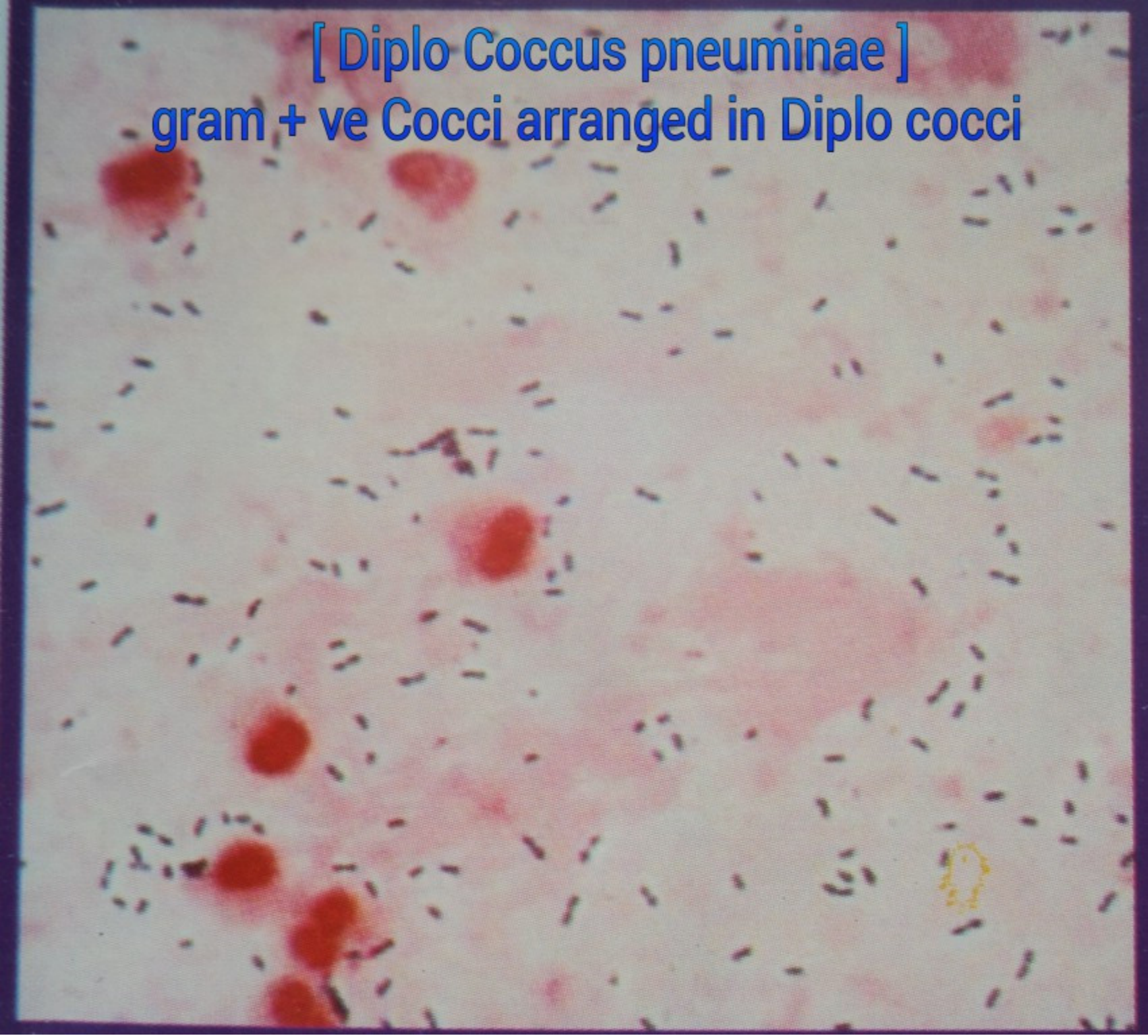
Preparation of bacterial film


Gram Positive
Gram Negative
Fixation
Crystal violet
Iodine treatment
Decolorization
Counter stain
safranin

Gram's stain

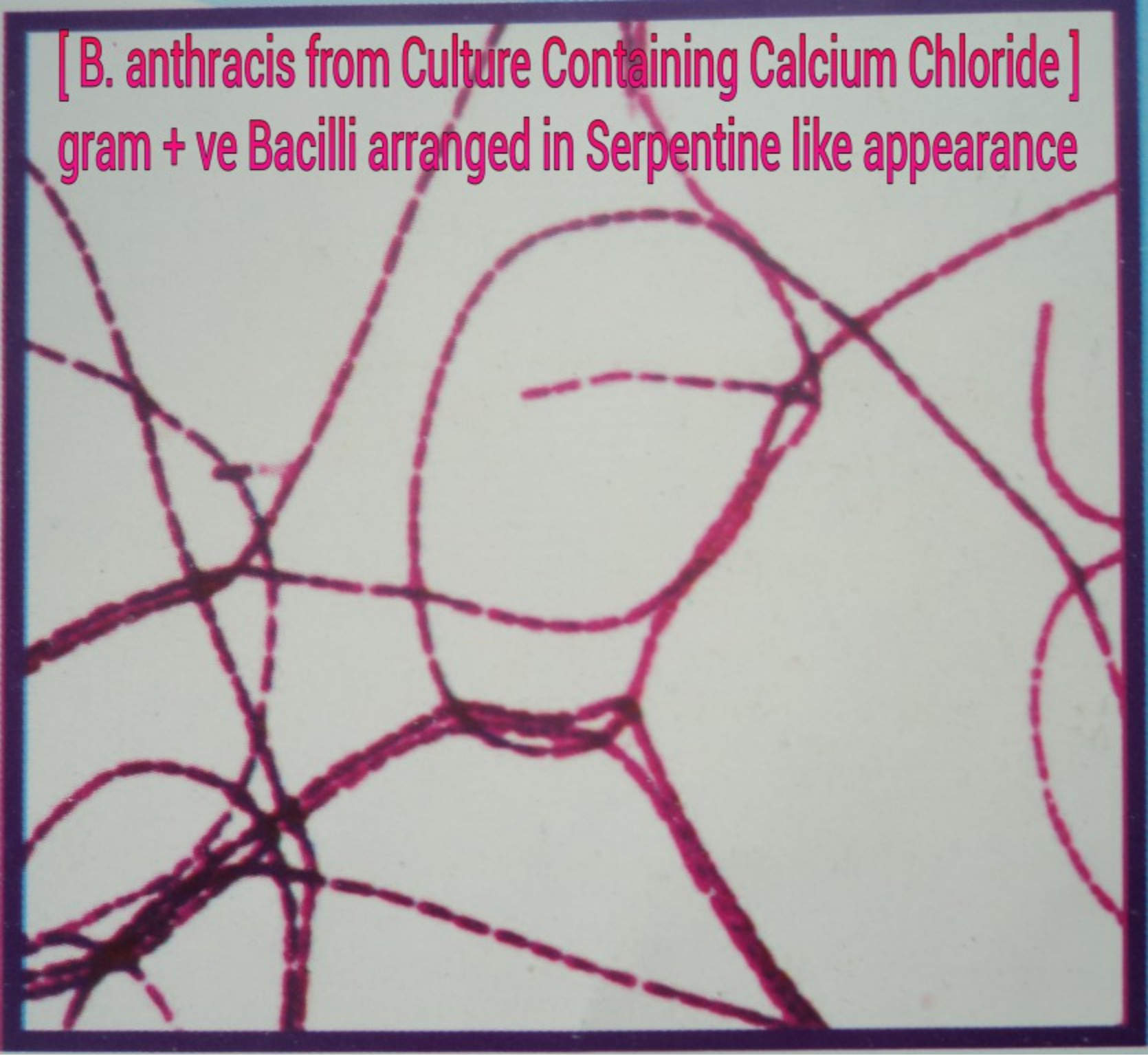

Bunches of grapes
[Staphylococci]
gram + ve Cocci arranged in
Clusters like Bunches of grabes


[streptococci]
gram + ve Cocci arranged in chains

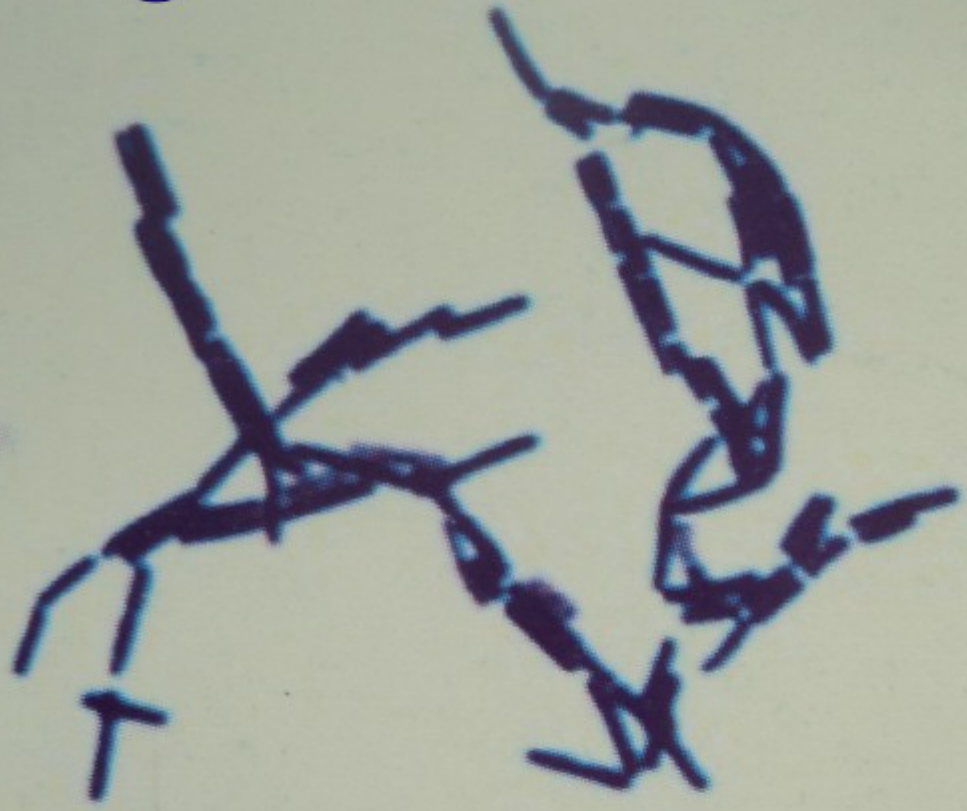

[Diplo Coccus pneuminae]
gram + ve Cocci arranged in Diplo cocci


[Enterococci]
gram + Ve Cocci arranged in
Short chains [lancet shape]


[B. anthracis from Culture Containing oxalates]
gram + ve Bacilli arranged in Chains with Central
oval Spore


[B. anthracis from Culture Containing Calcium Chloride]
gram + ve Bacilli arranged in Serpentine like appearance

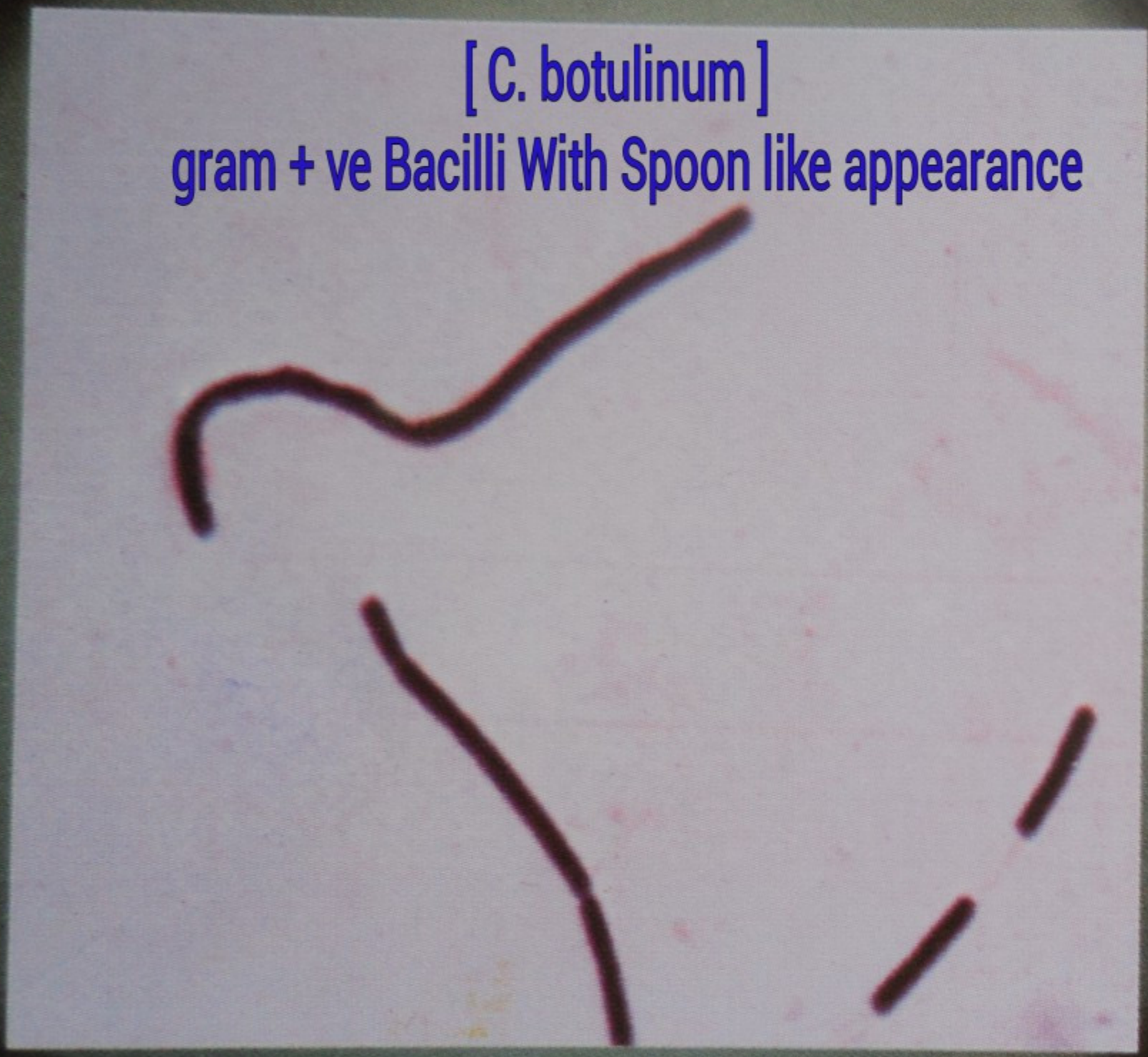
[B. Cereus]
gram + ve Bacilli



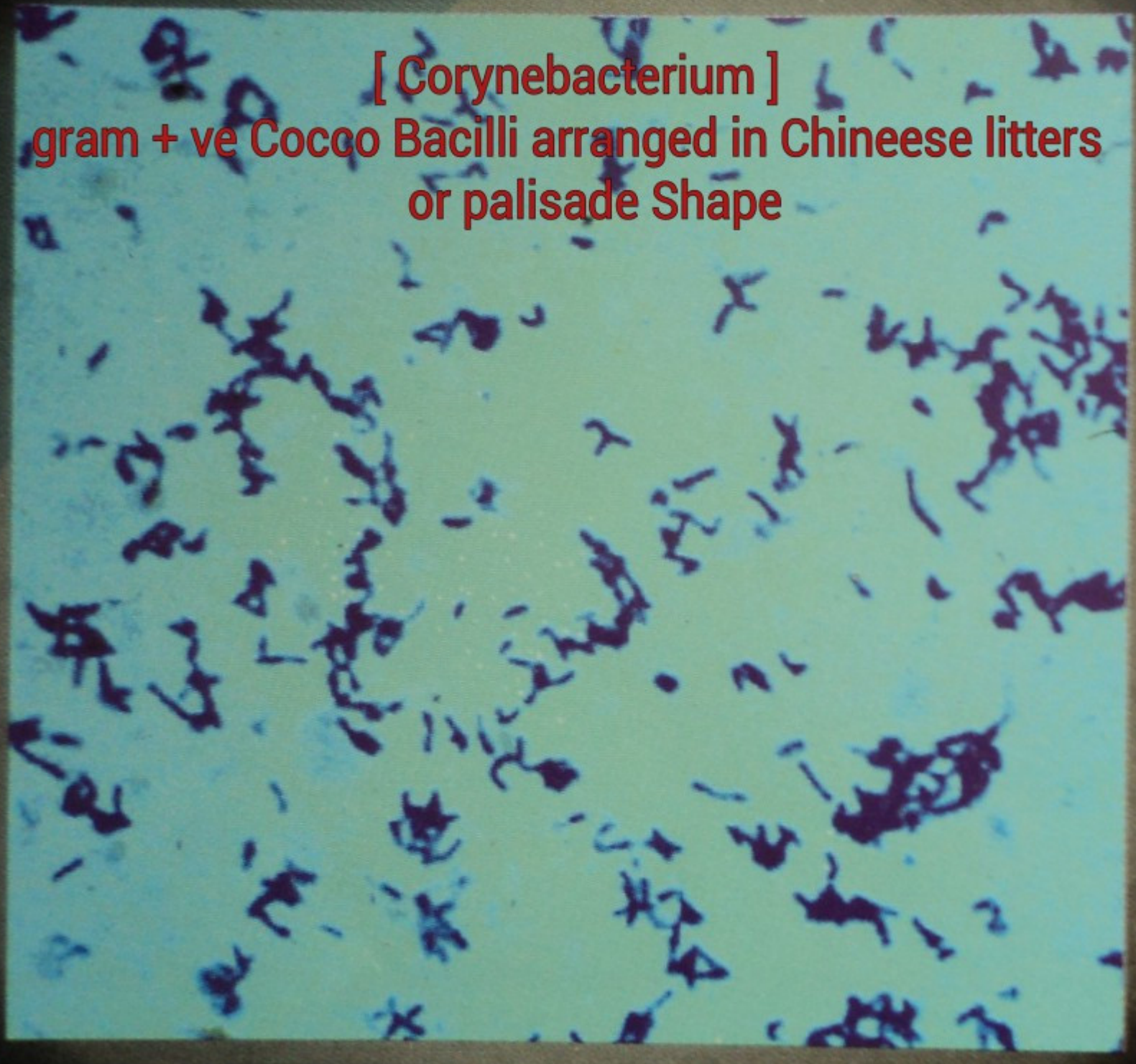

[C. tetani]
gram + Ve Bacilli with
drumstick like appearance

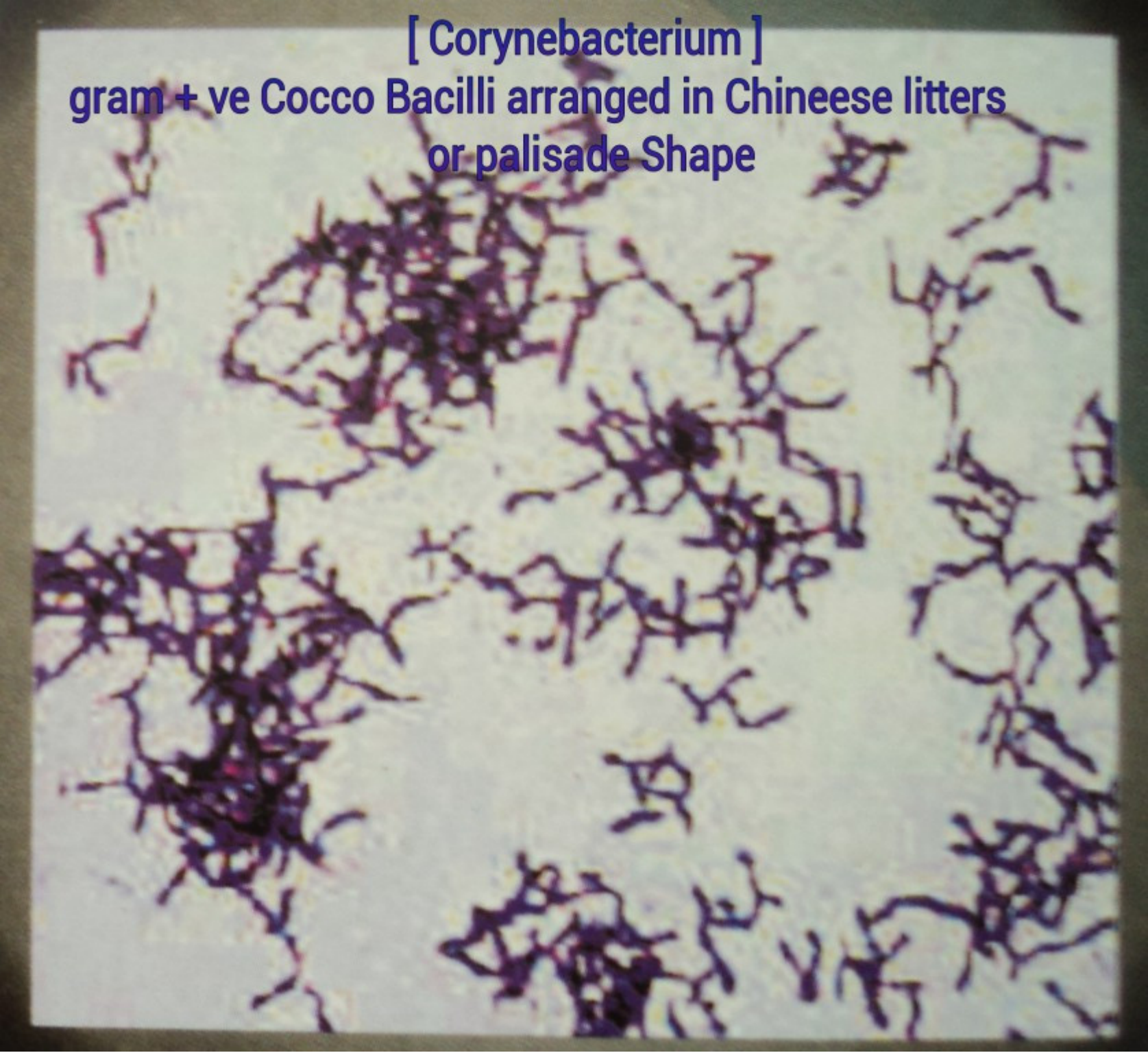
[C. botulinum]

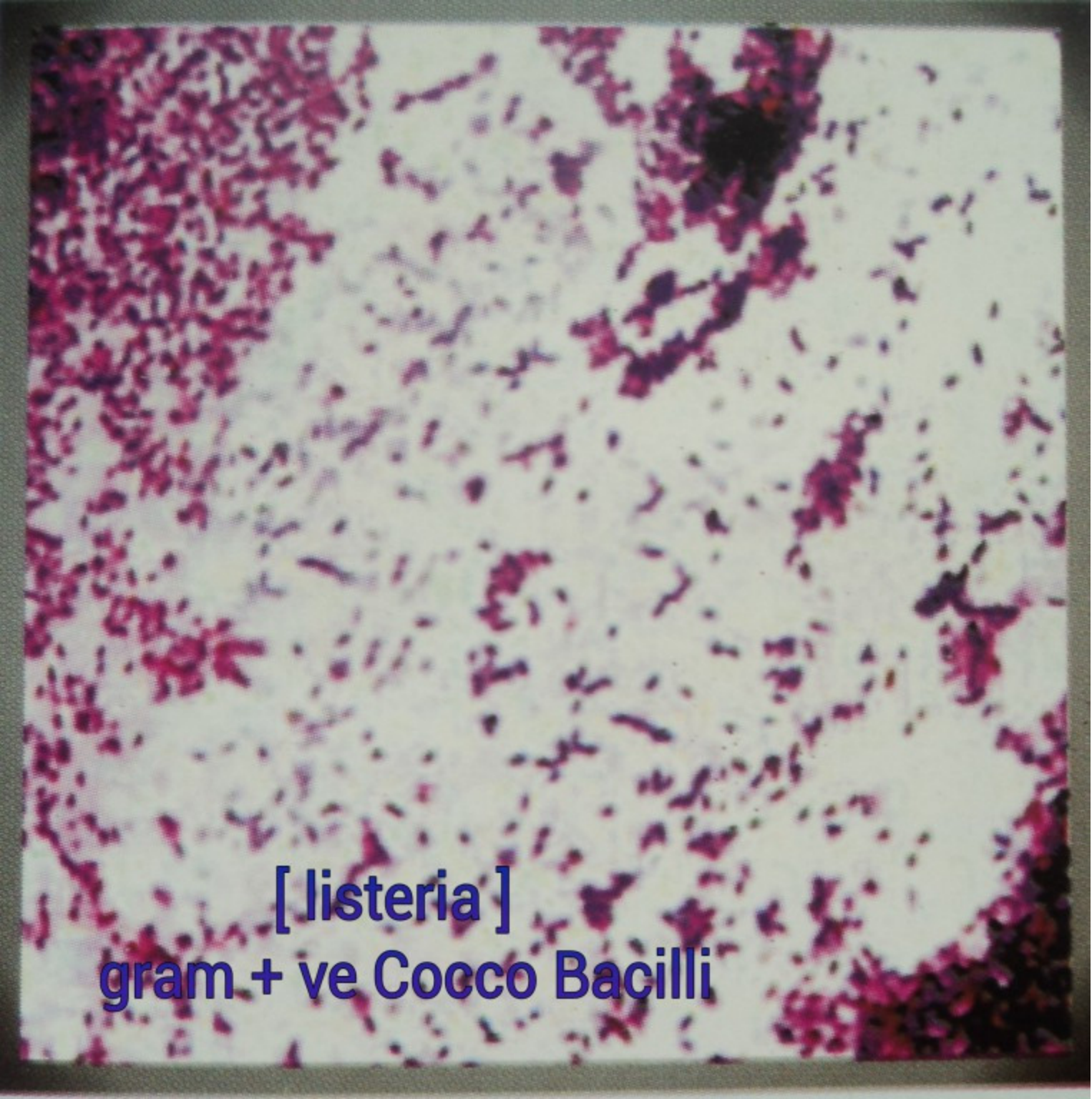
gram + ve Bacilli With Spoon like appearance



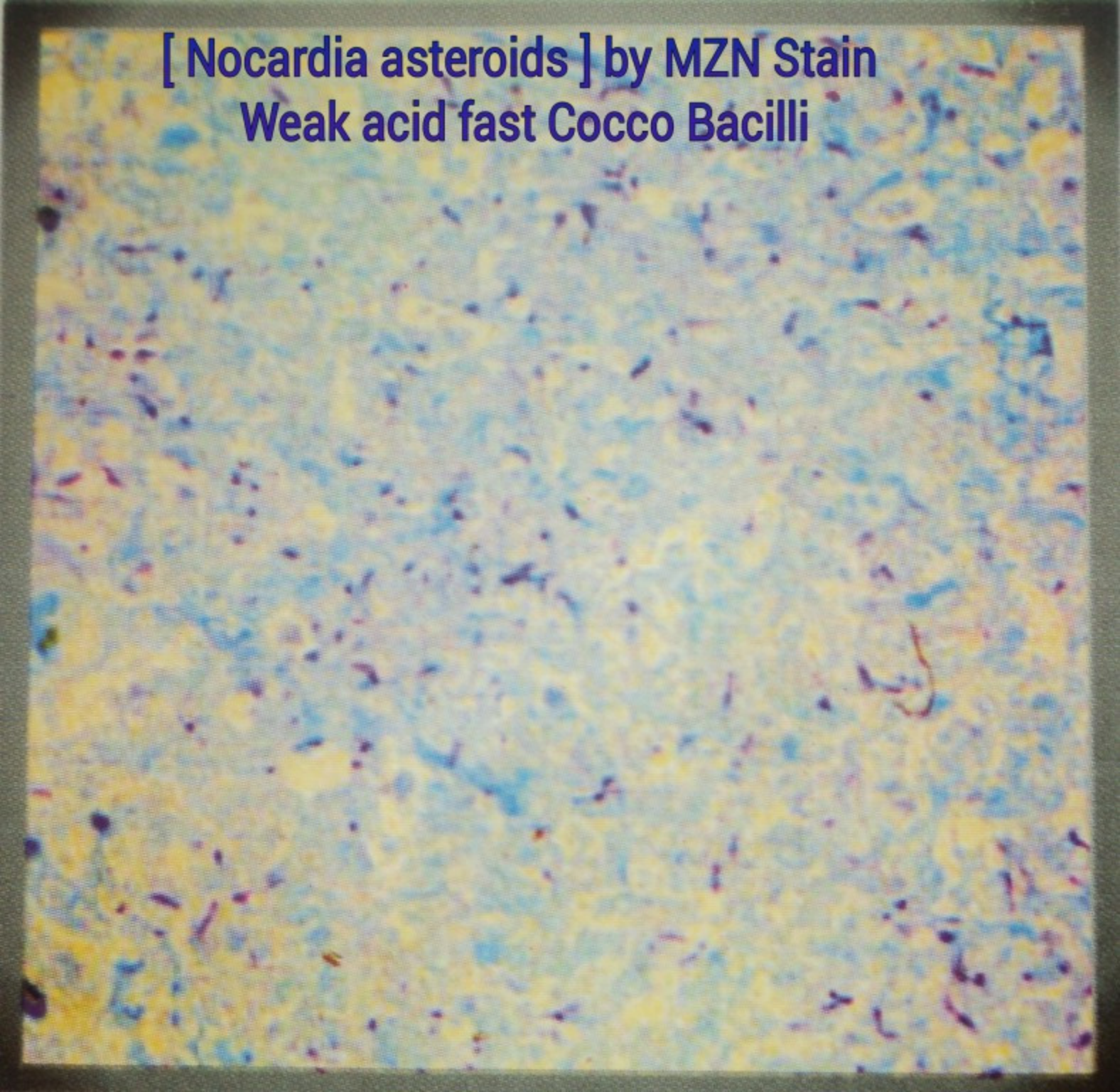

[C. botulinum]
gram + ve Bacilli With Spoon like appearance

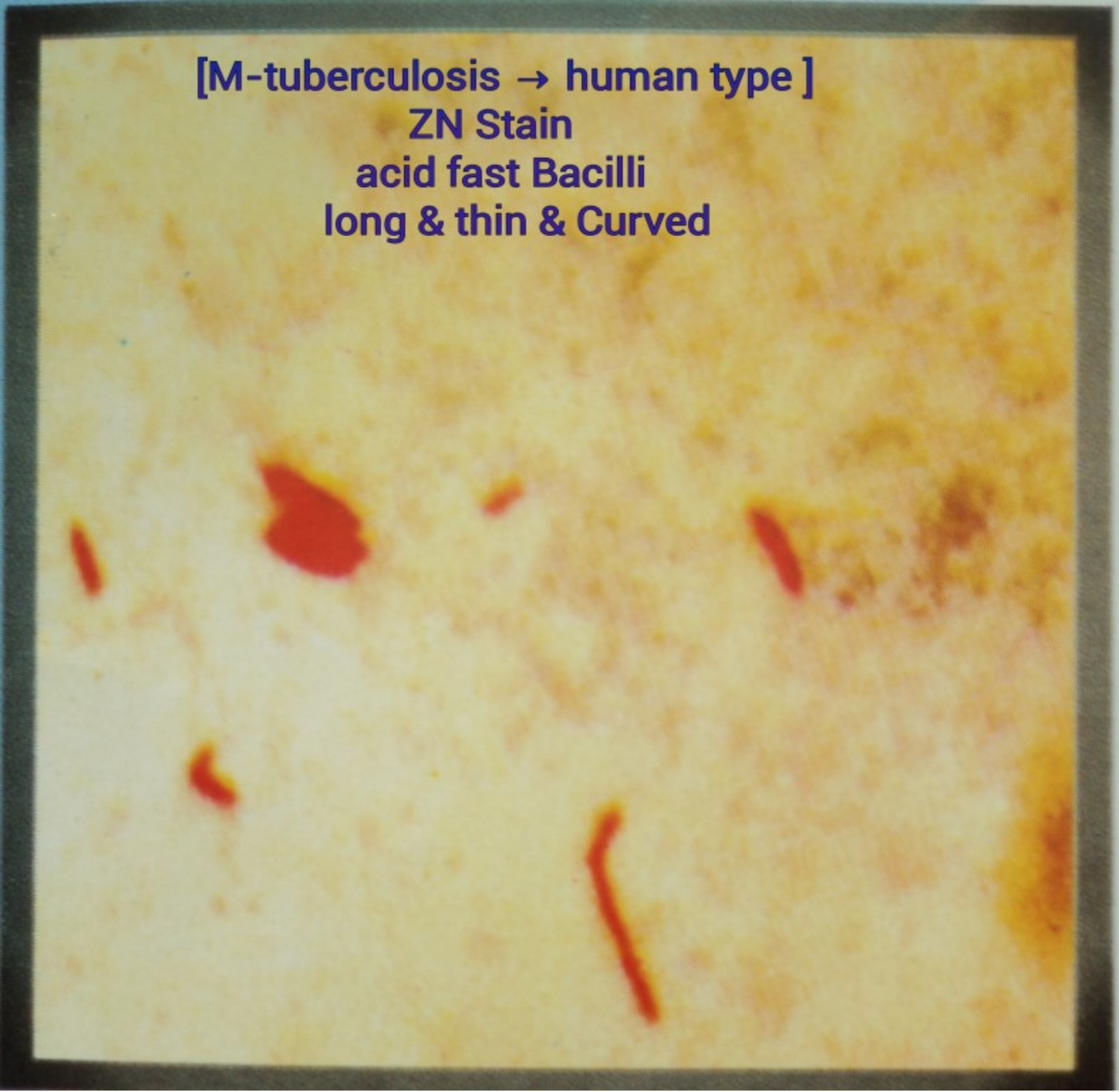

[Corynebacterium]
gram + ve Cocco Bacilli arranged in Chineese litters
or palisade Shape

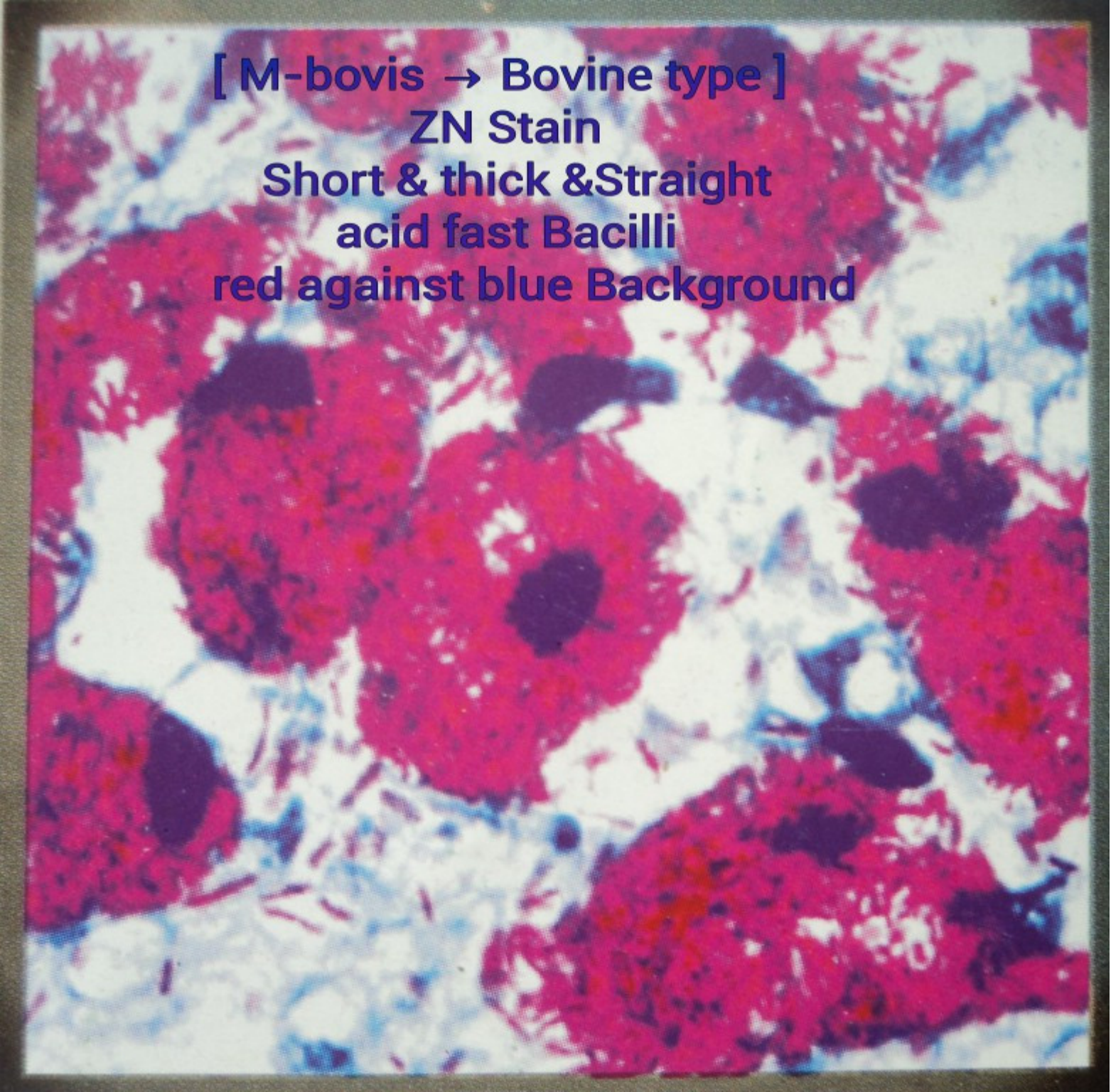

[Corynebacterium]
gram + ve Cocco Bacilli arranged in Chineese litters
or palisade Shape

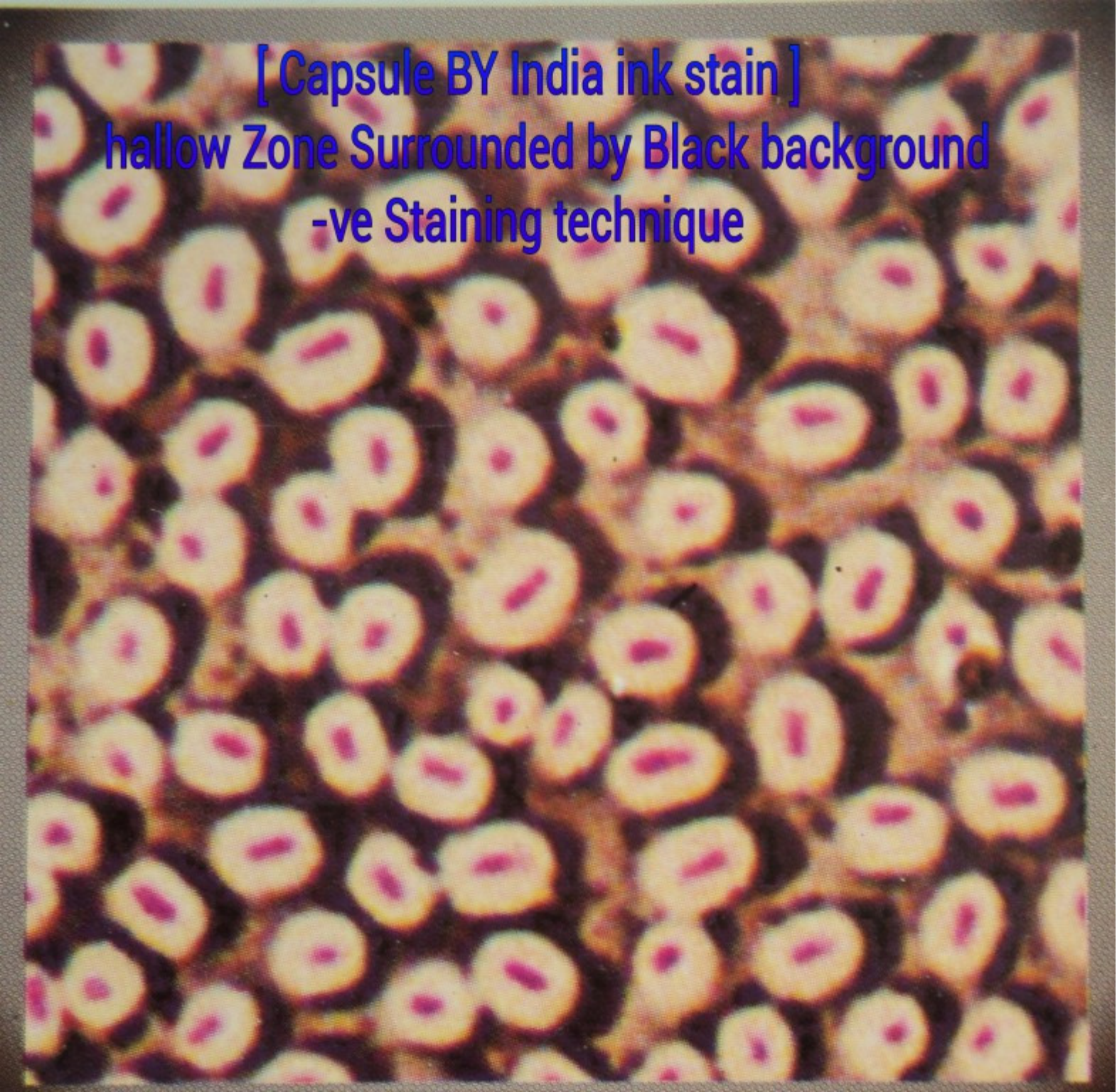

[listeria]
gram + ve Cocco Bacilli

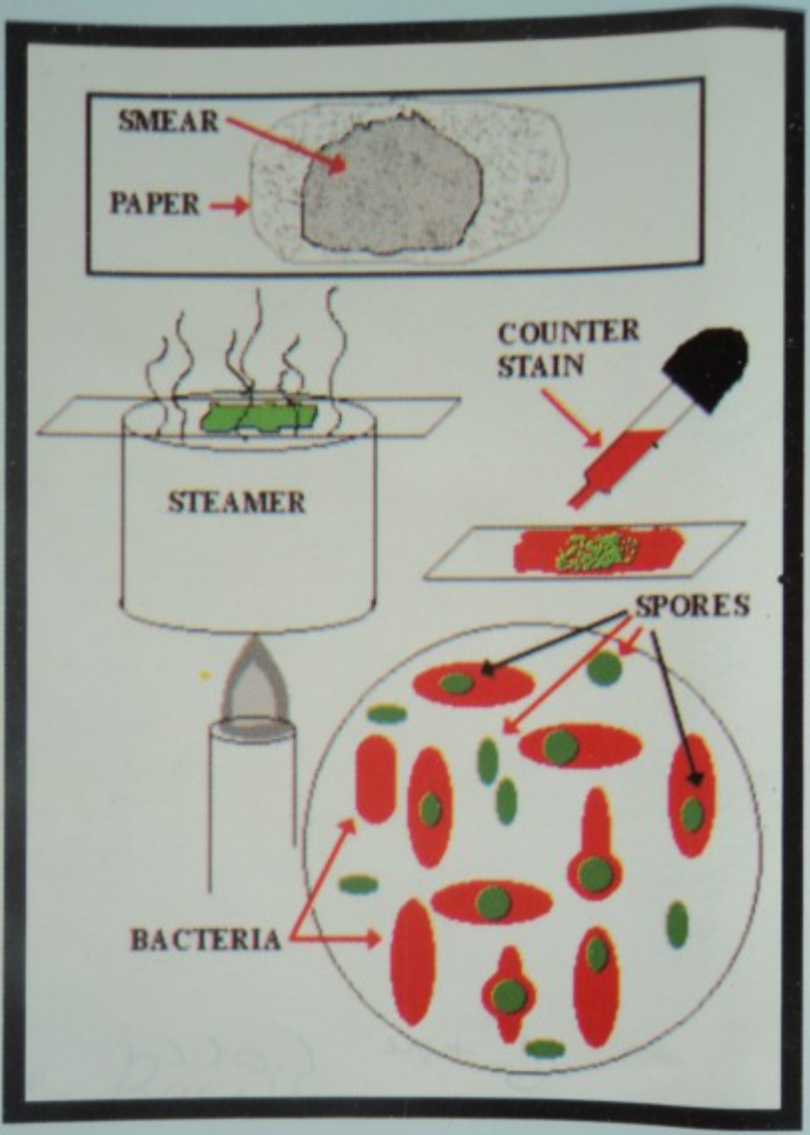

[Rhodococcus equi]
gram + ve Cocci


[Nocardia asteroids] by MZN Stain
Weak acid fast Cocco Bacilli


[M-tuberculosis → human type]
ZN Stain
acid fast Bacilli
long & thin & Curved

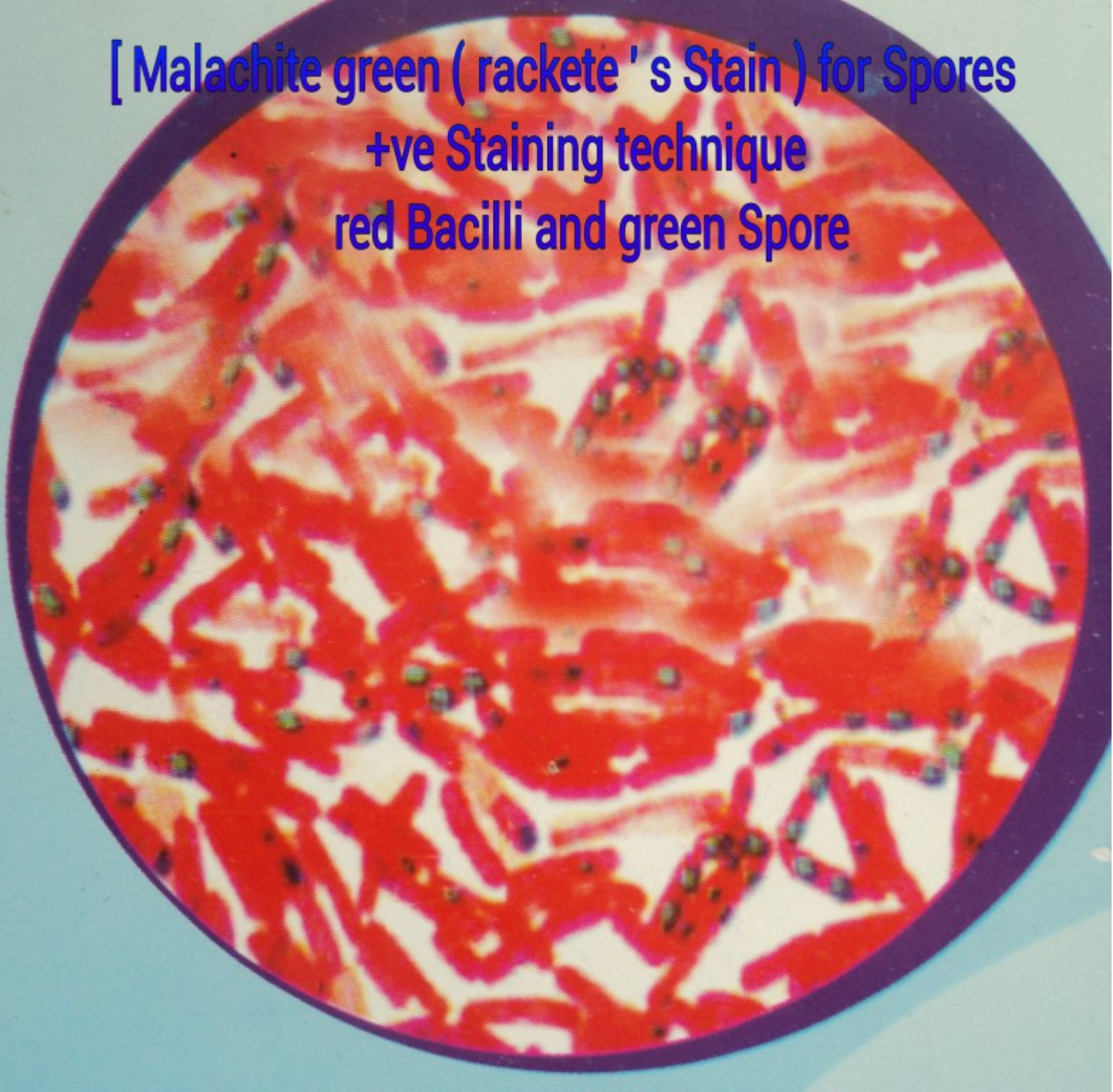

[M-bovis → Bovine type]
ZN Stain
Short & thick &Straight
acid fast Bacilli
red against blue Background


[Capsule BY India ink stain]
hallow Zone Surrounded by Black background
-ve Staining technique



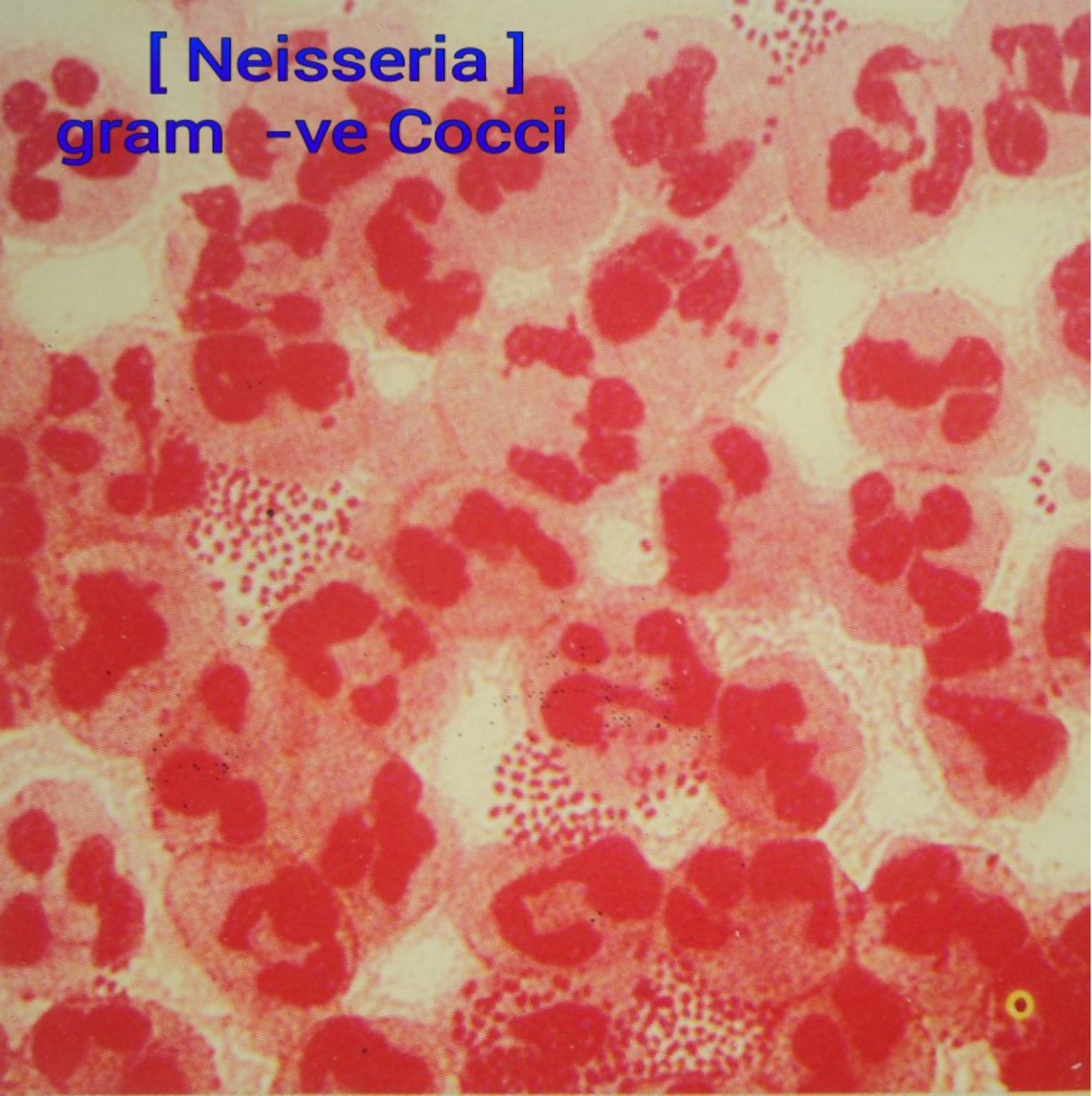
Steps of staining by Malachite green (Rachetes's stain) for spores

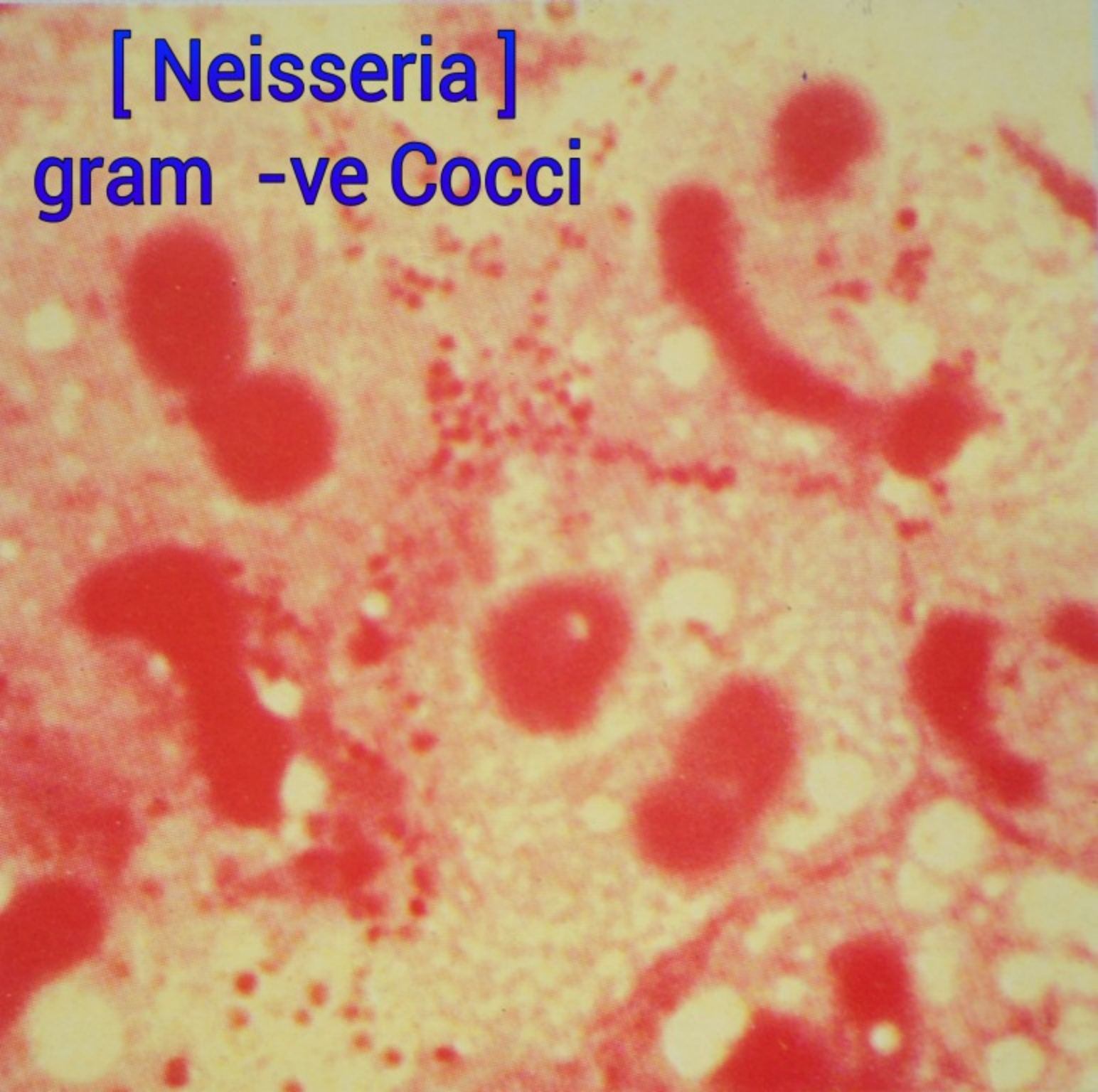
[Malachite green (rackete ' s Stain) for Spores
+ve Staining technique
red Bacilli and green Spore

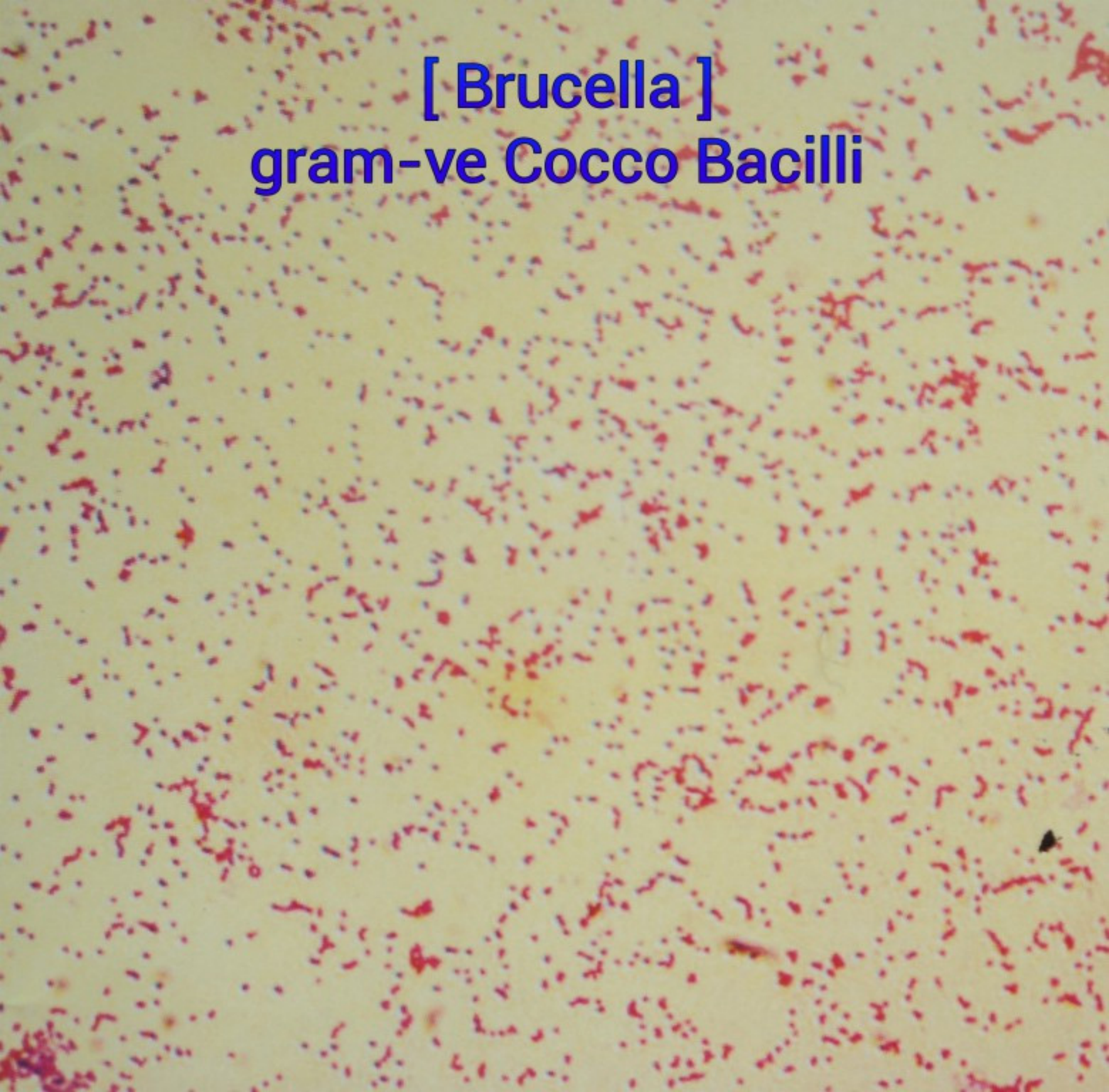


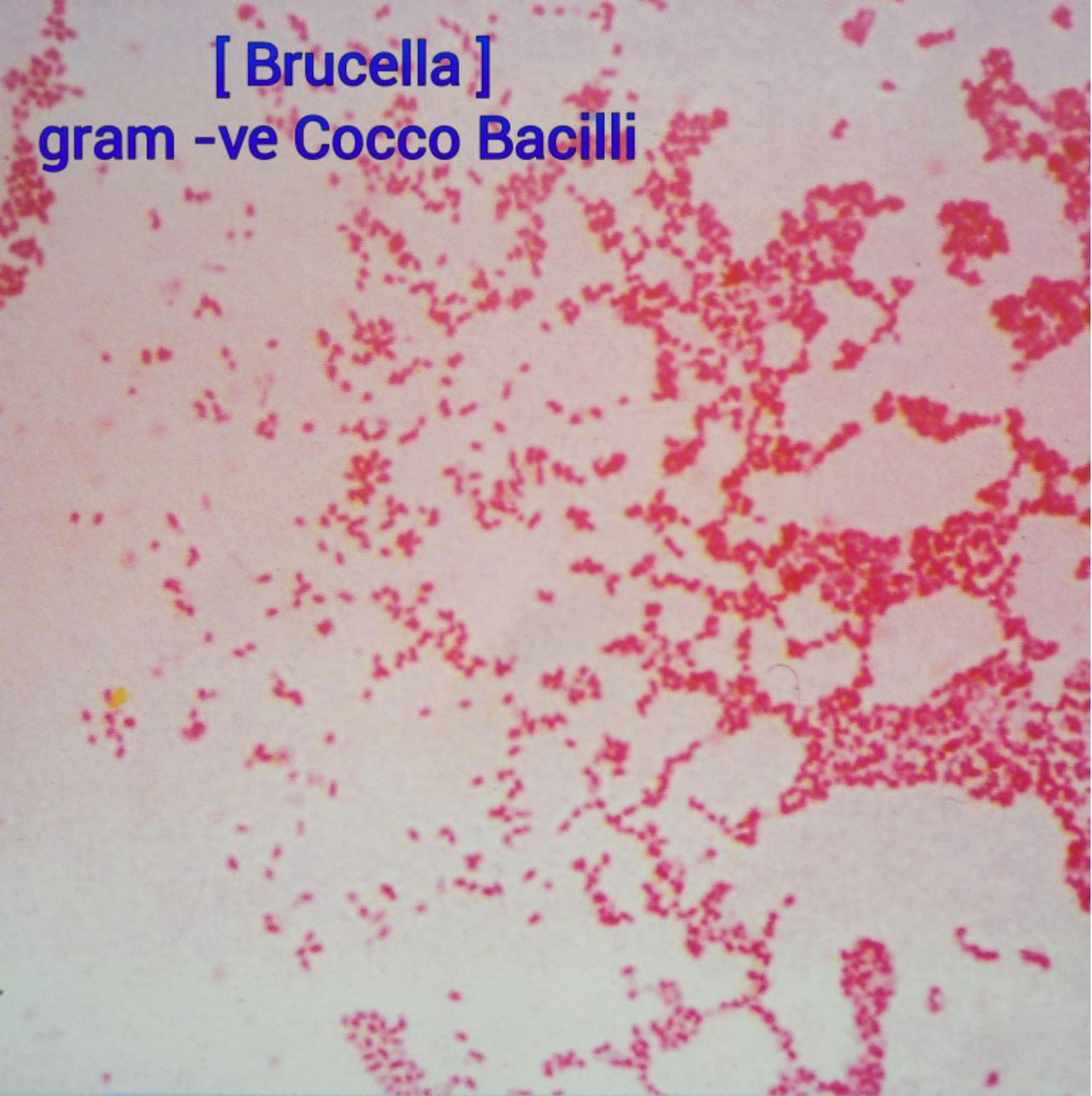

[pseudomonas aeurginosa]
gram -ve Cocco Bacilli

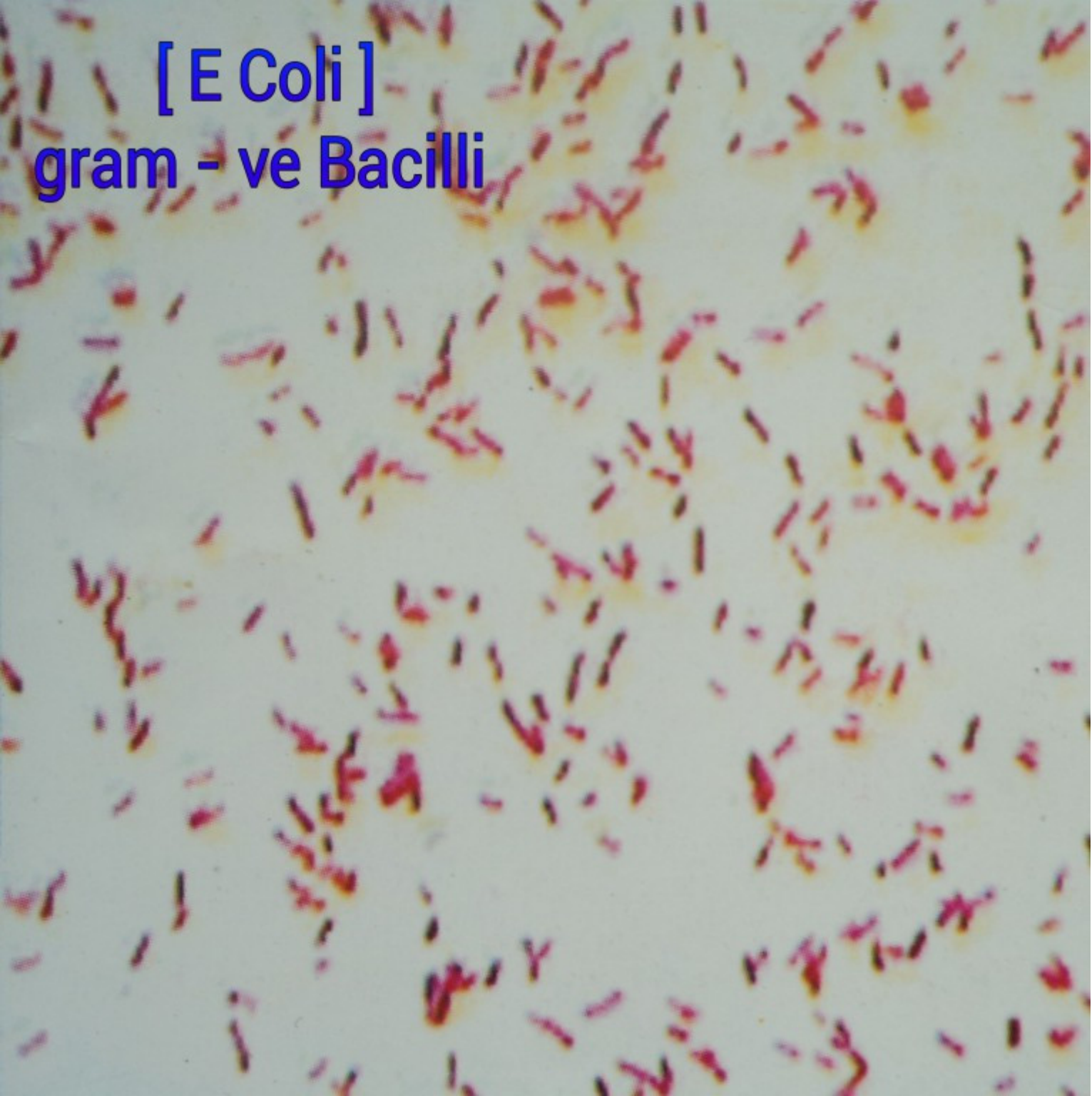

[Moraxella bovis]
gram -ve Thick bacilli

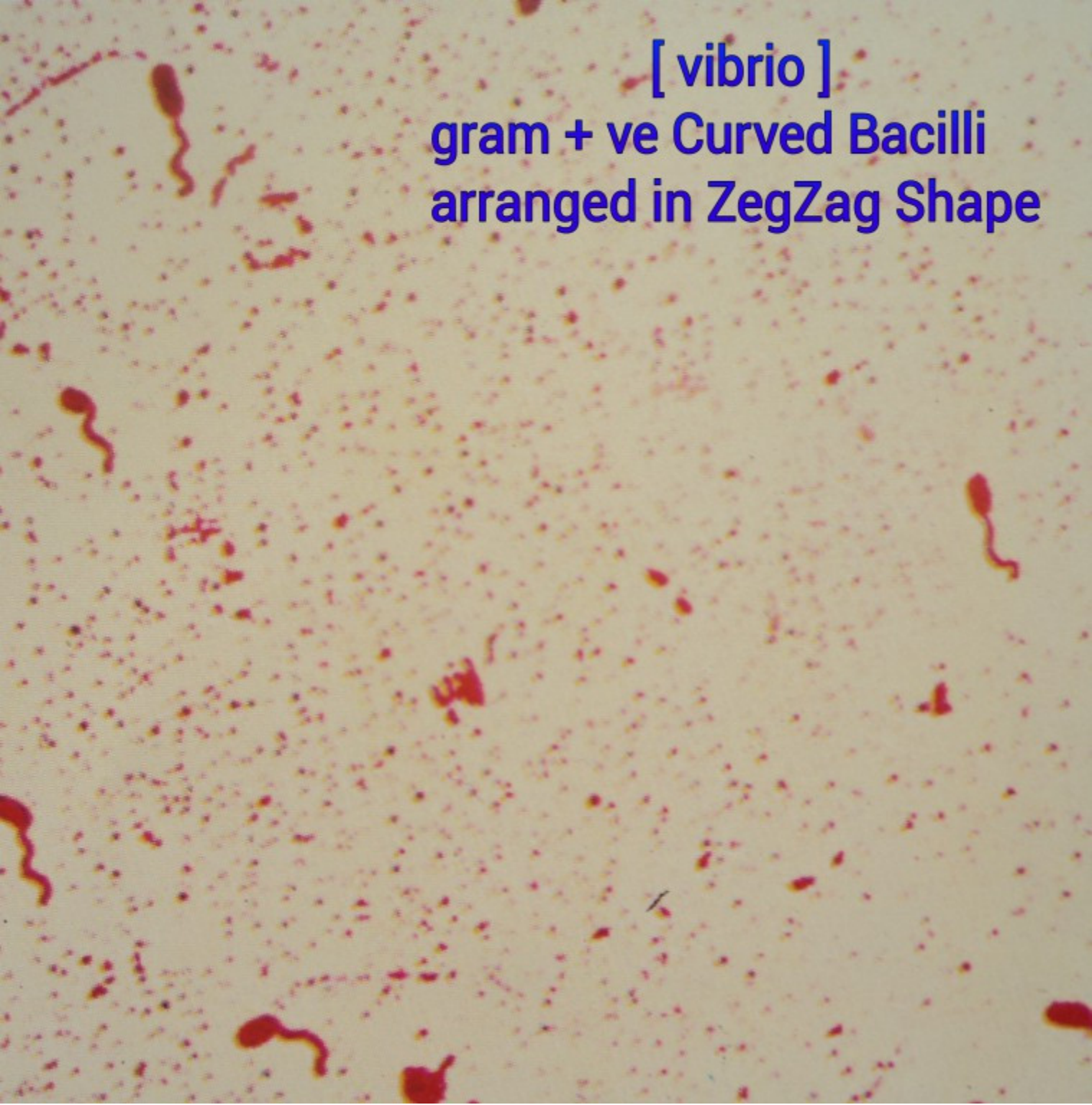

[Neisseria]
gram -ve Cocci

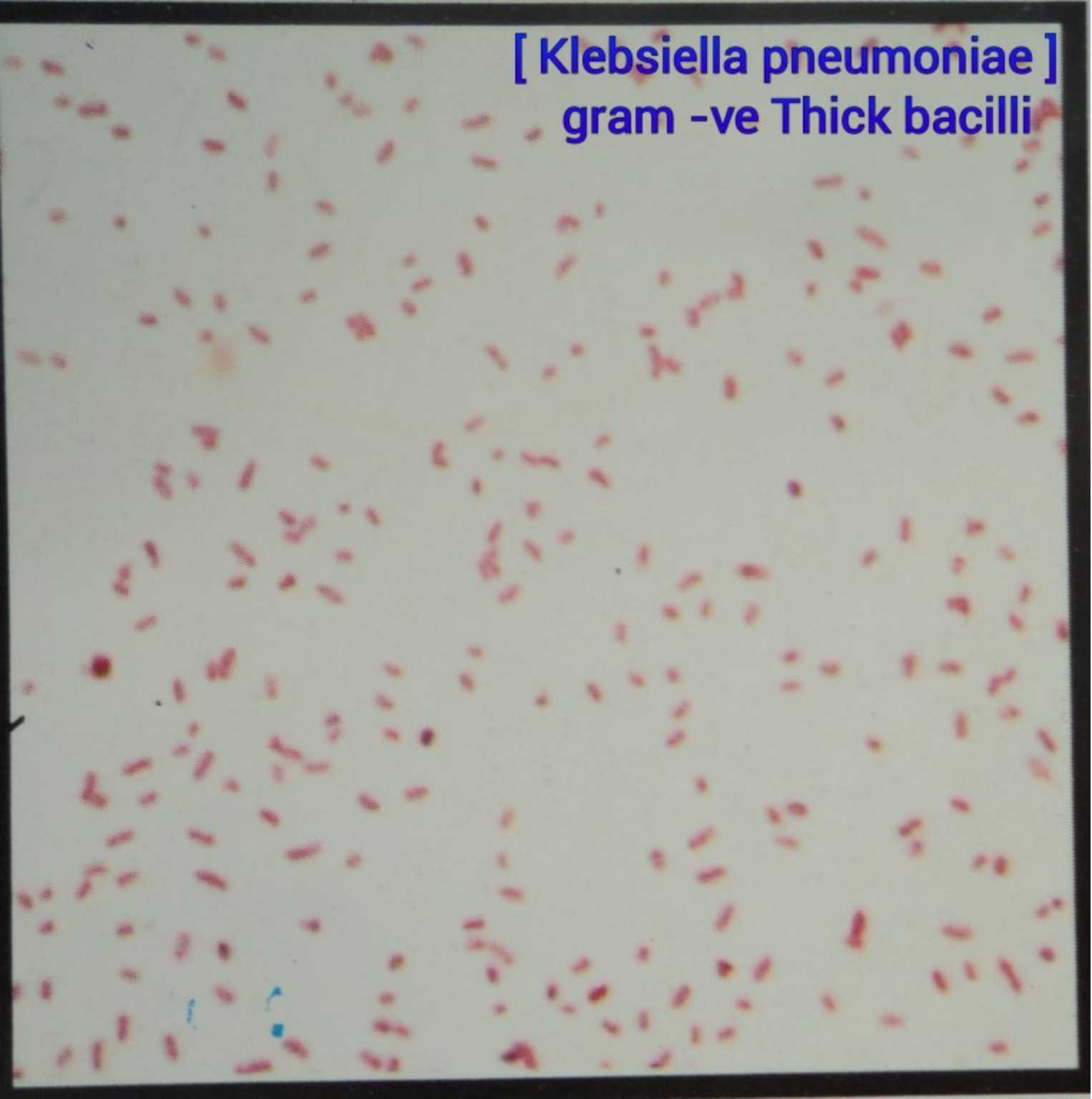

[Neisseria]
gram -ve Cocci

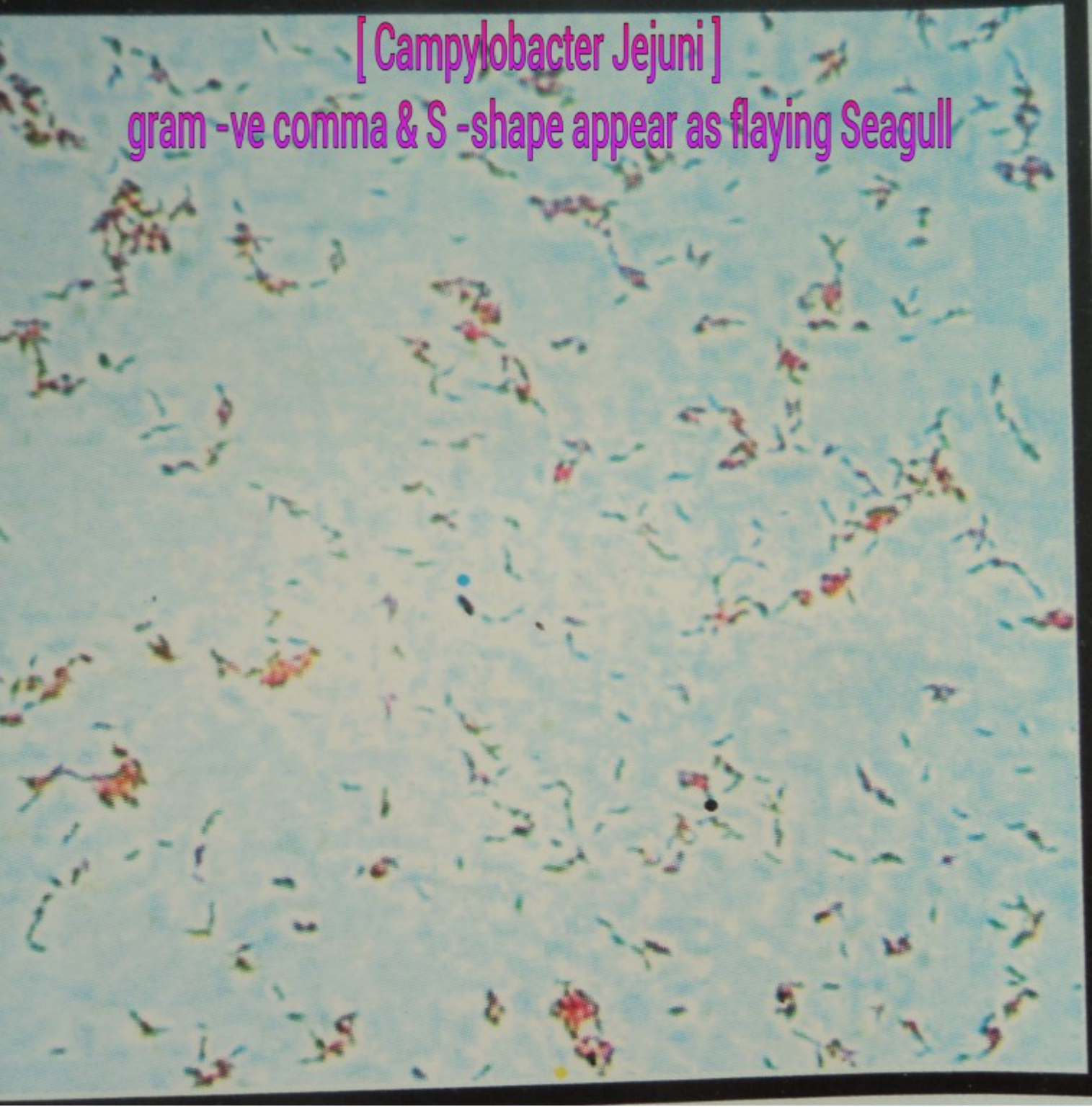

[Brucella]
gram-ve Cocco Bacilli

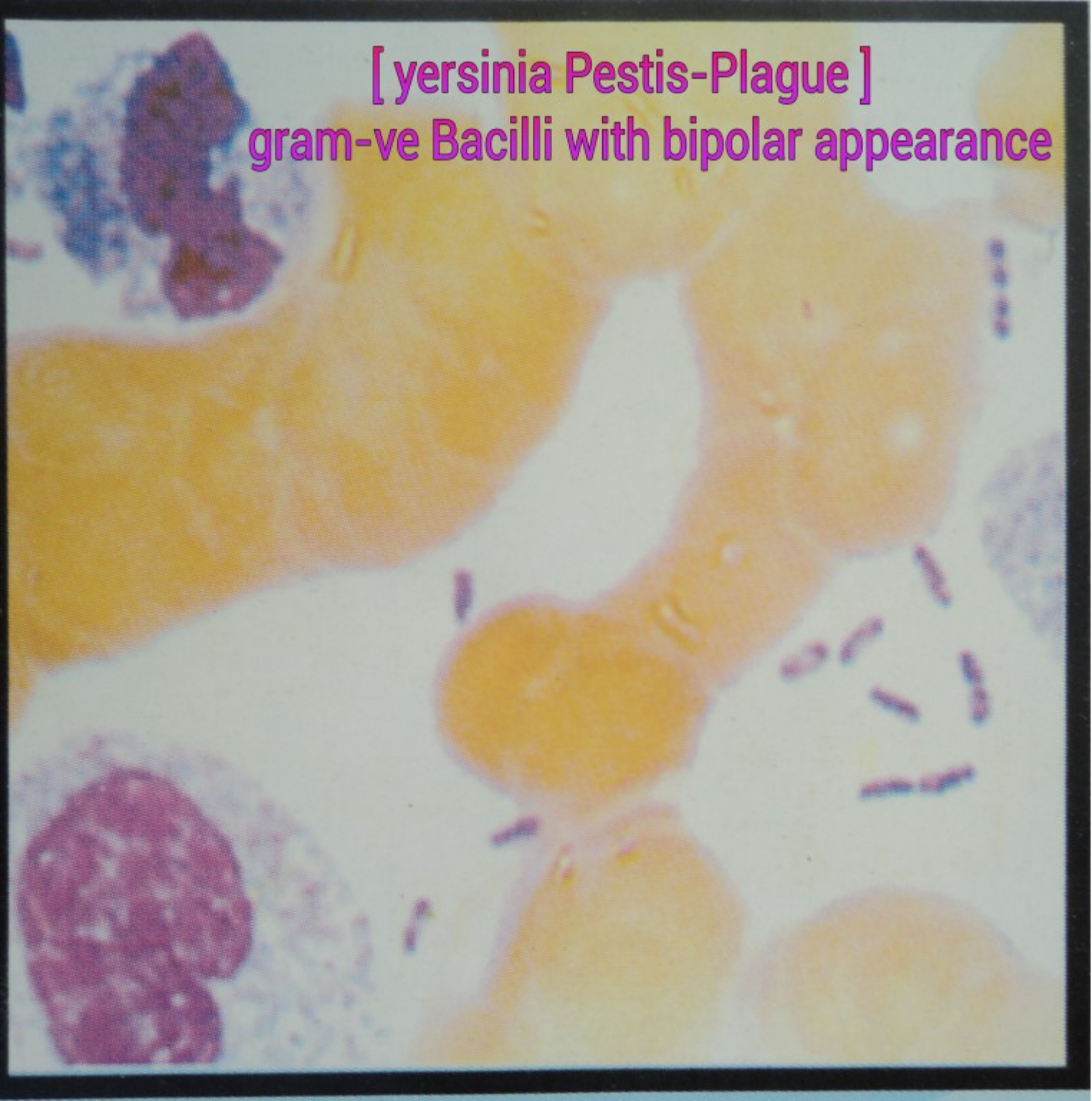

[Brucella]
gram -ve Cocco Bacilli

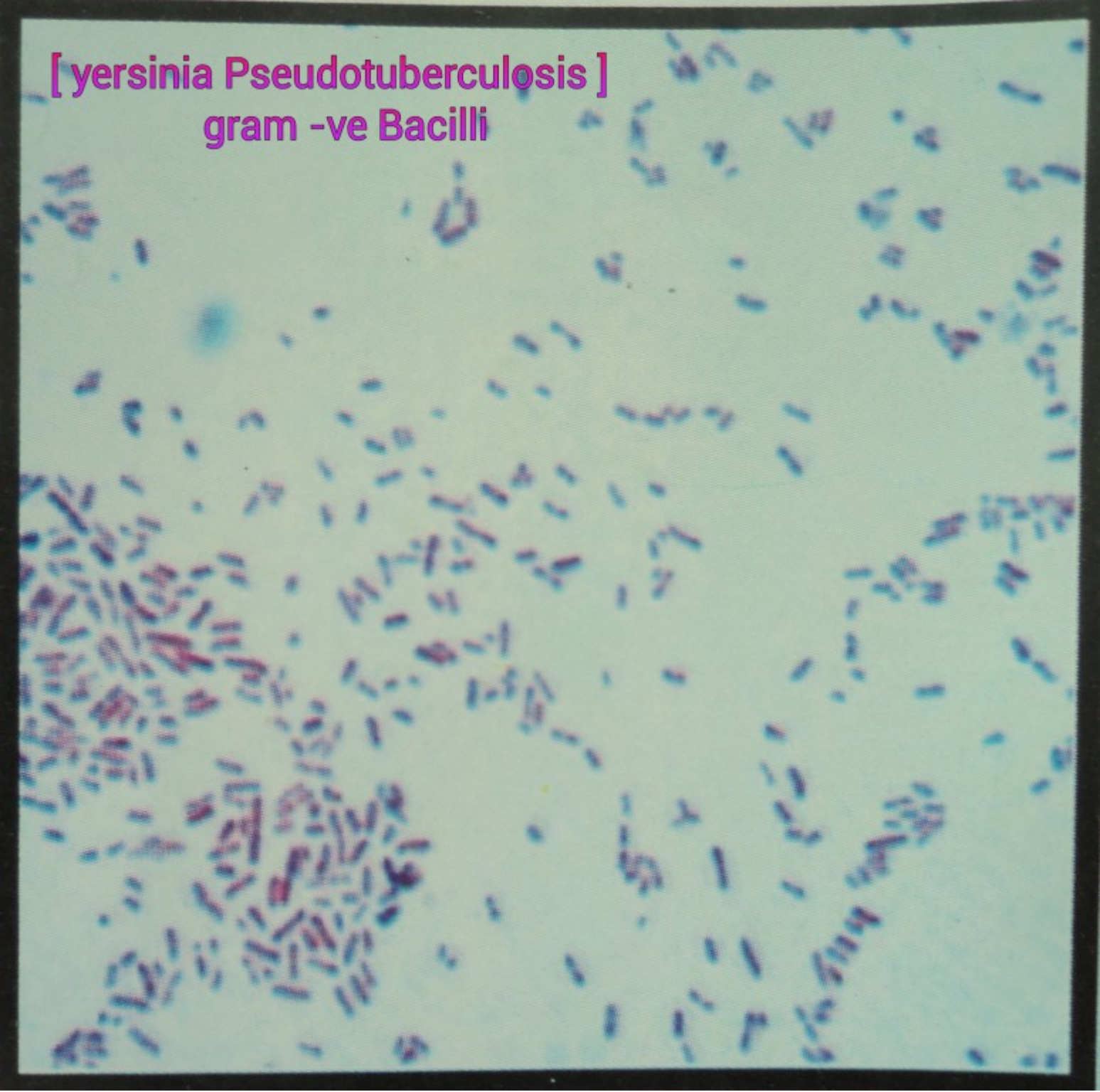

[E Coli]
gram - ve Bacilli

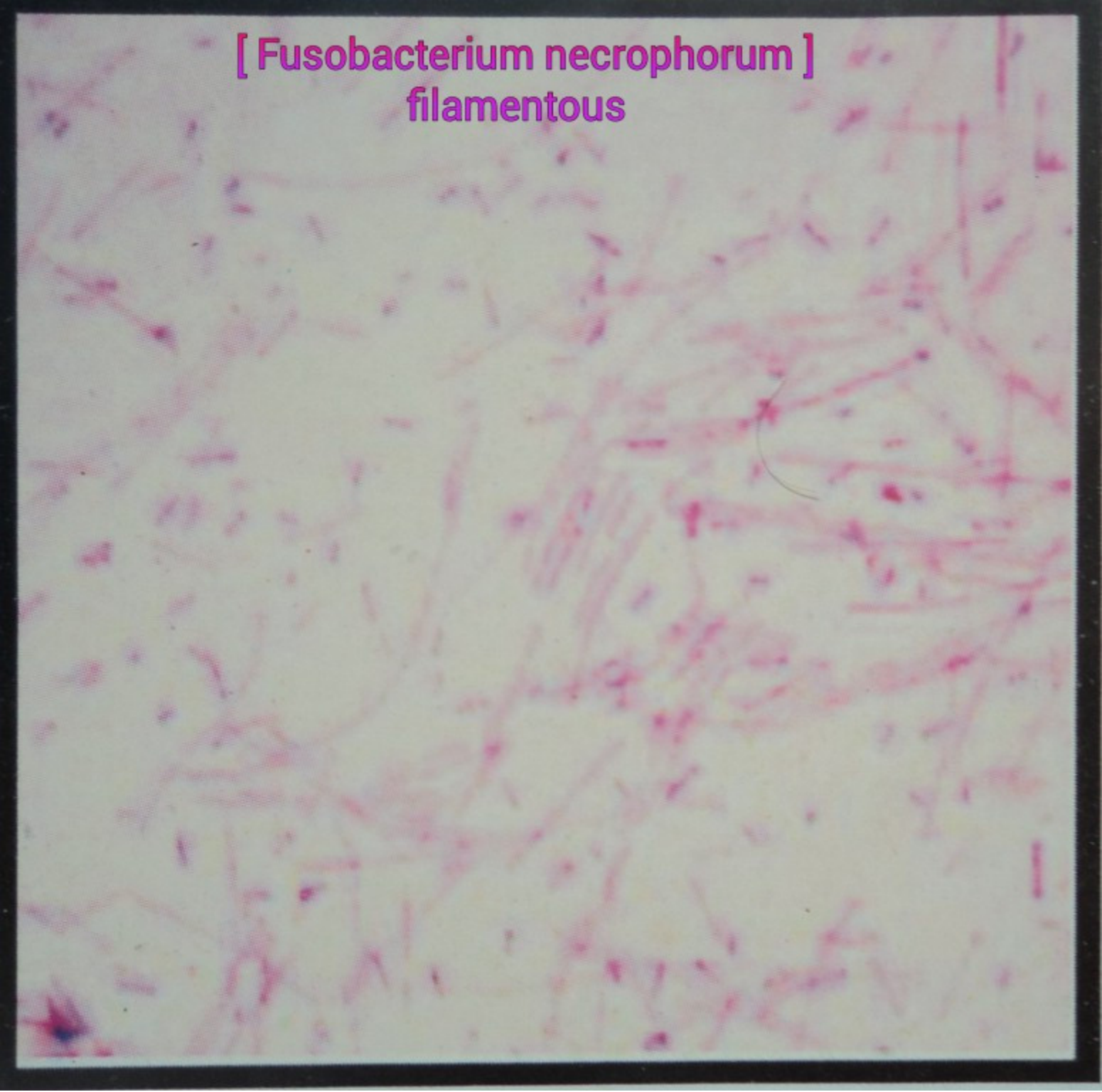

[vibrio]
gram + ve Curved Bacilli
arranged in ZegZag Shape


[Klebsiella pneumoniae]
gram -ve Thick bacilli

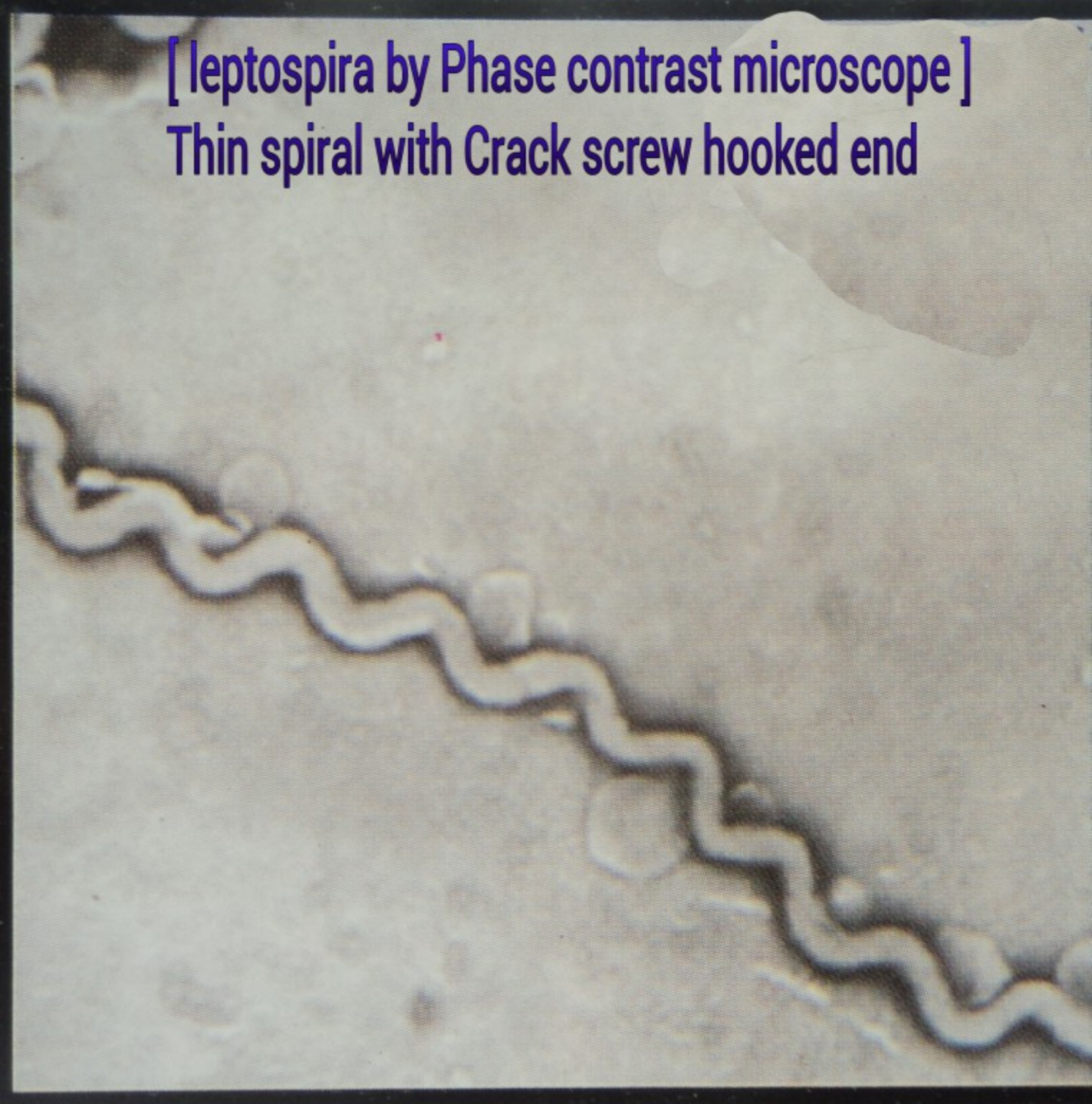

[Campylobacter Jejuni]
gram -ve comma & S -shape appear as flaying Seagull


[yersinia Pestis-Plague]
gram-ve Bacilli with bipolar appearance

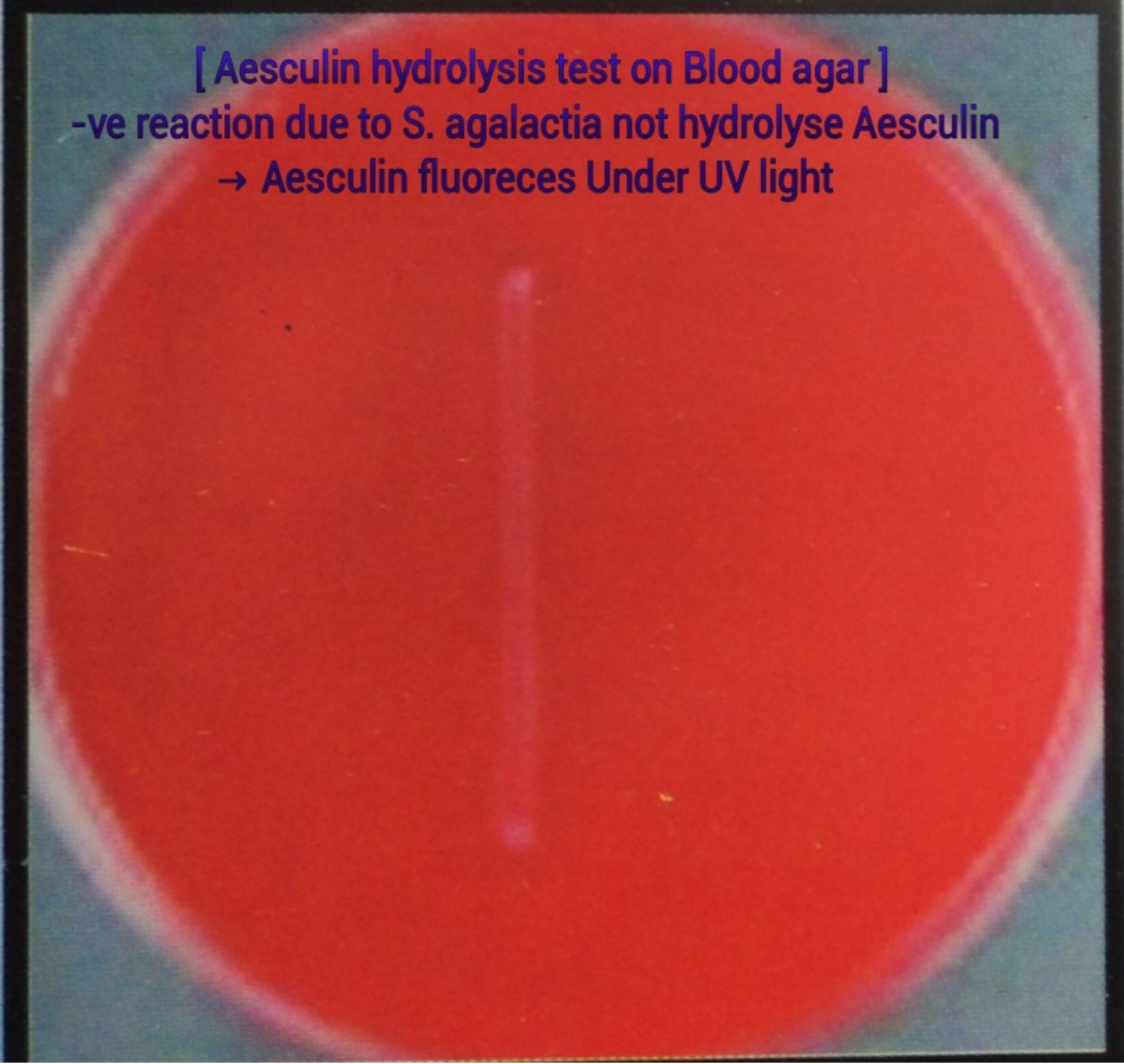

[yersinia Pseudotuberculosis]
gram -ve Bacilli


[Fusobacterium necrophorum]
filamentous

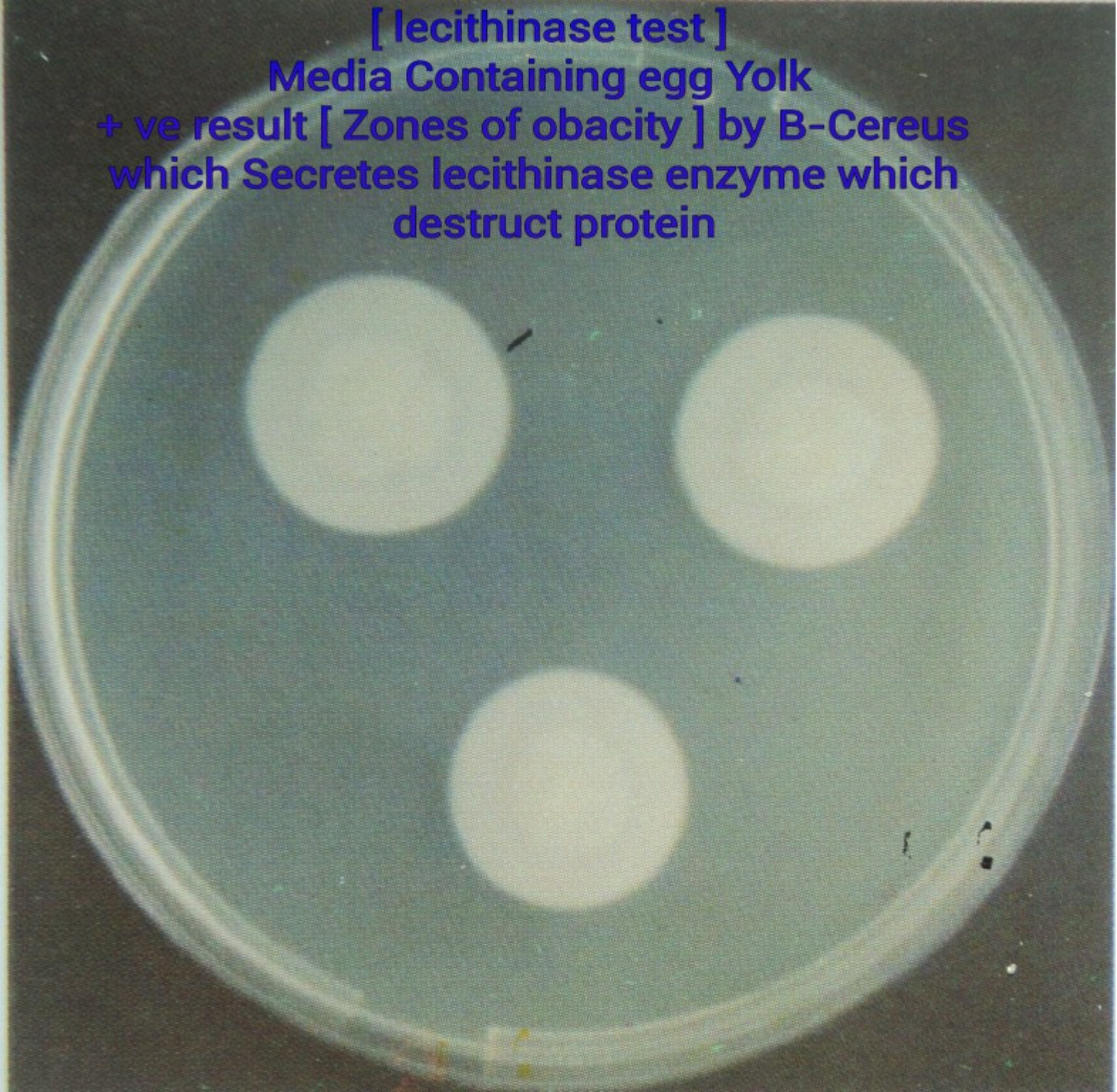

[leptospira by Silver impregnation Stain]
Thin spiral with Crack screw hooked end

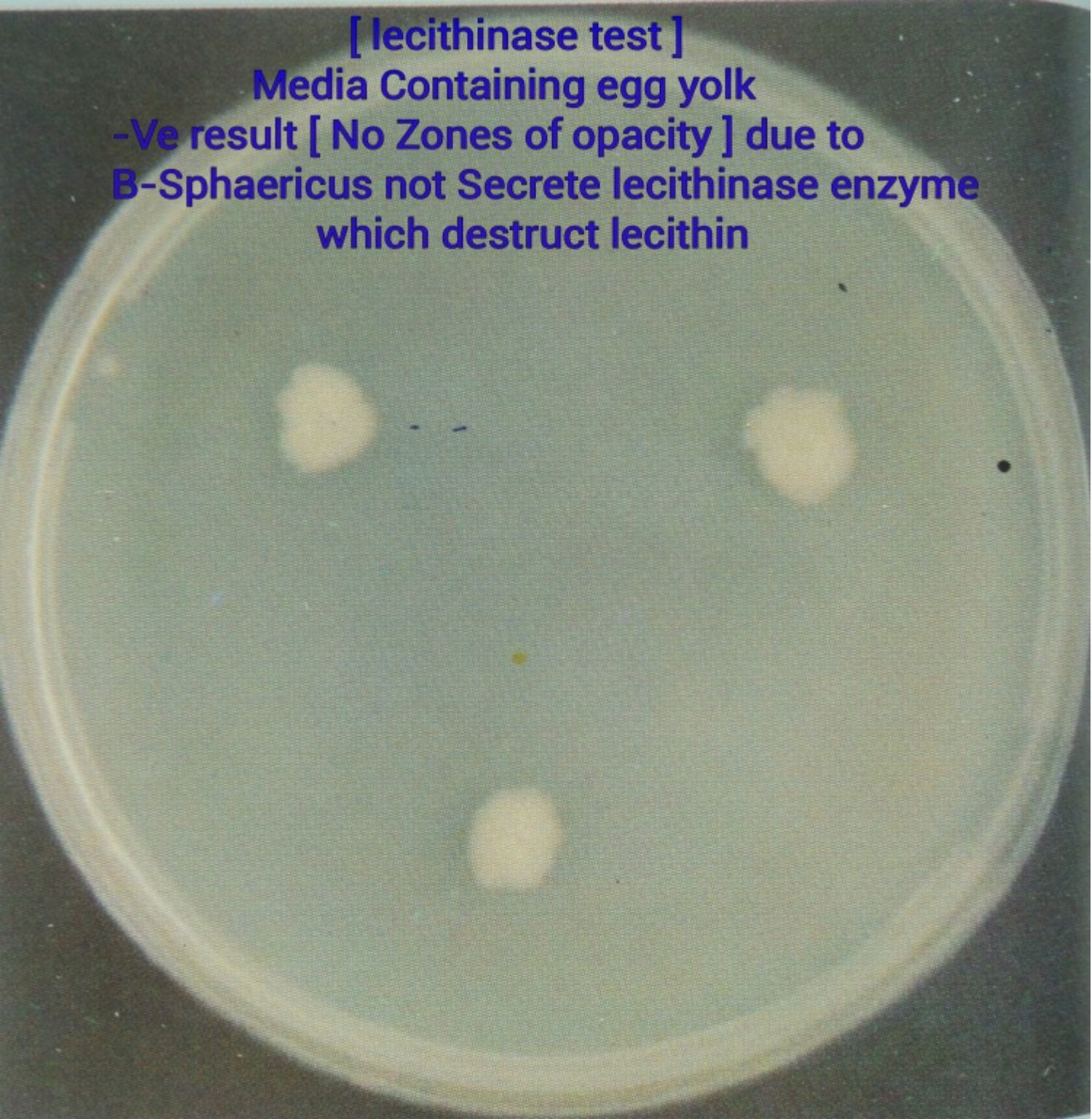

[leptospira by Phase contrast microscope]
Thin spiral with Crack screw hooked end

[Borrelia]
Thick spiral bacteria


[Aesculin hydrolysis test on Blood agar]
-ve reaction due to S. agalactia not hydrolyse Aesculin
→ Aesculin fluoreces Under UV light


[Aesculin hydrolysis test on Blood agar]
+Ve reaction due to E. faecalis hydrolyse Aesculin
→ Aesculin not fluoresces under UV light

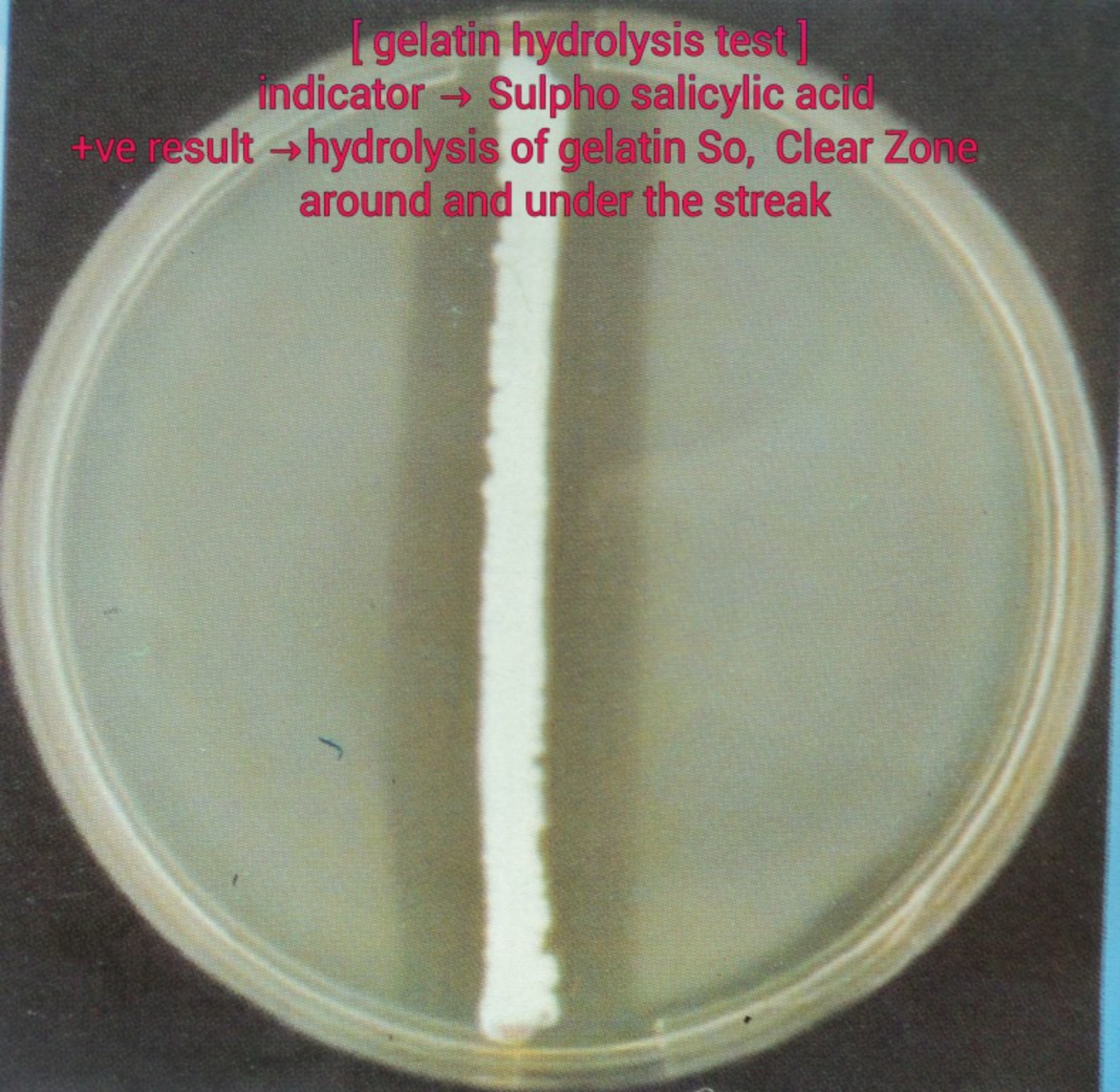

[lecithinase test]
Media Containing egg Yolk
+ ve result [Zones of obacity] by B-Cereus
which Secretes lecithinase enzyme which
destruct protein

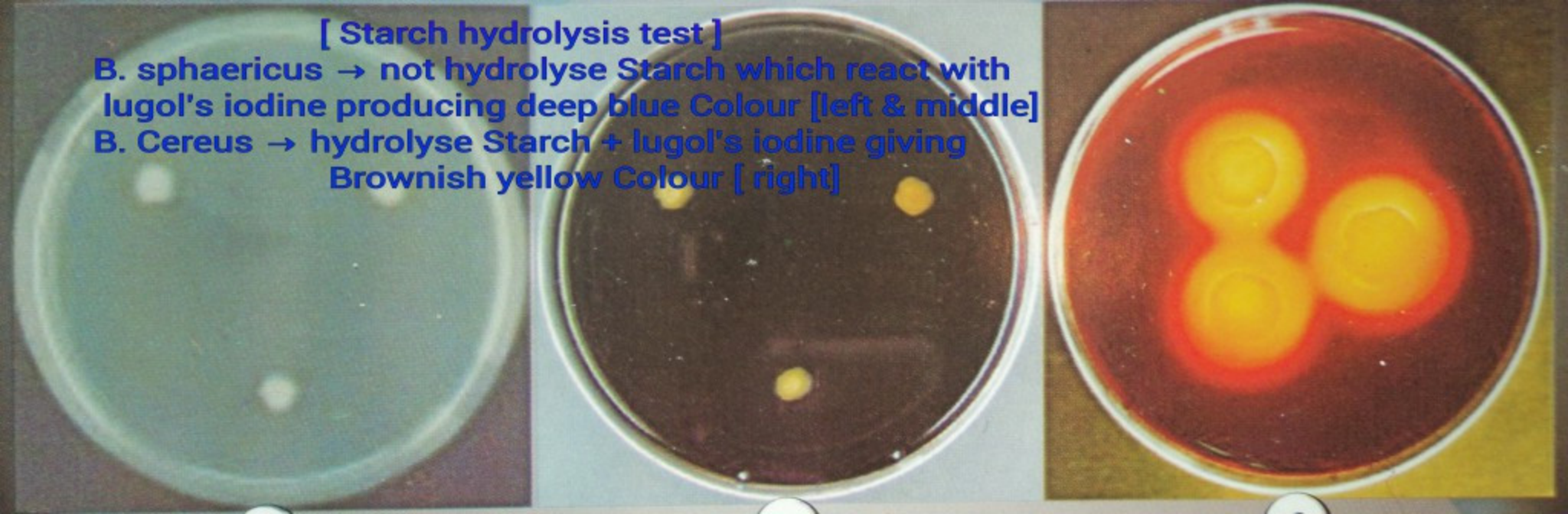

[lecithinase test]
Media Containing egg yolk
-Ve result [No Zones of opacity] due to
B-Sphaericus not Secrete lecithinase enzyme
which destruct lecithin

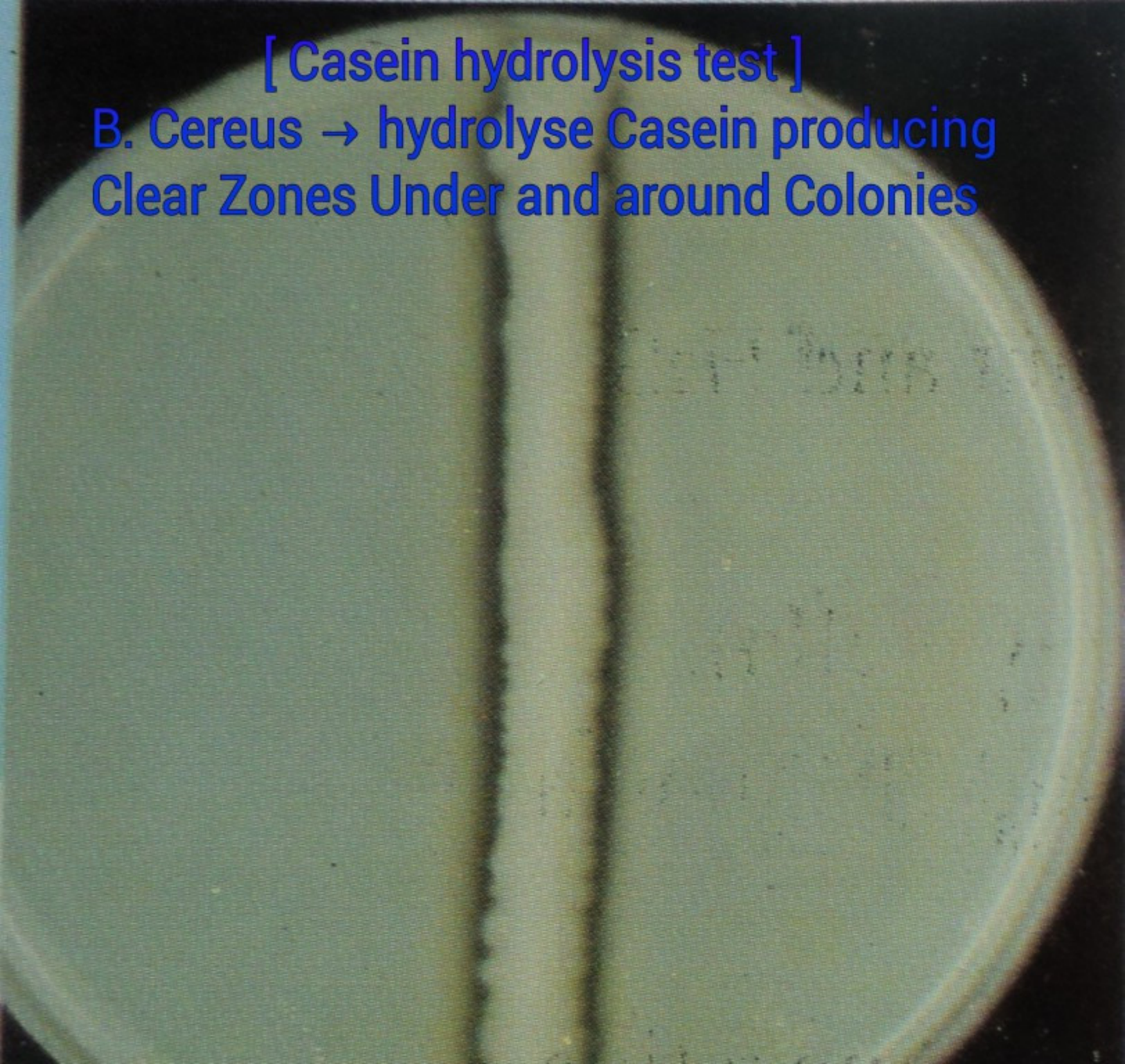

[DNA hydrolysis test on toluidine - blue DNA agar media]
-ve result → One of the thermophilic Campylobacters not hydrolyse DNA So, No Pink Zone around Colony

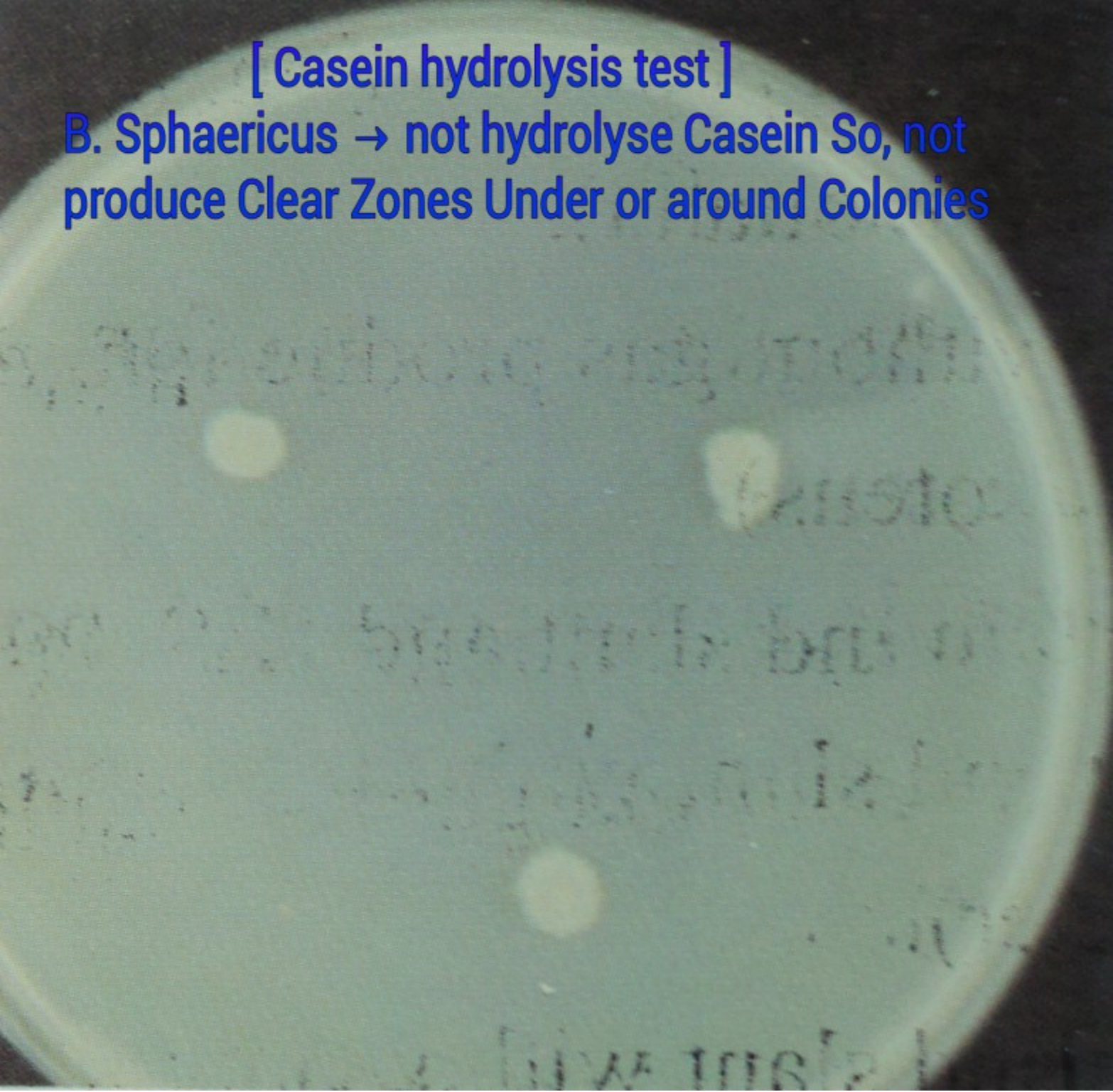

[DNA hydrolysis test on toluidine-blue DNA agar media]
+ Ve result → C. JeJuni Sub sp . Jejuni biotype II
hydrolysed DNA So, Pink Zones around Colony


[gelatin hydrolysis test]
indicator → Sulpho salicylic acid
-ve result → no hydrolysis of gelatin So, no Clear Zone
around and under the streak


[gelatin hydrolysis test]
indicator → Sulpho salicylic acid
+ve result → hydrolysis of gelatin So, Clear Zone
around and under the streak


[Starch hydrolysis test]
B. sphaericus → not hydrolyse Starch which react with lugol's iodine producing deep blue Colour [left & middle]
B. Cereus → hydrolyse Starch + lugol's iodine giving Brownish yellow Colour [right]


[Casein hydrolysis test]
B. Cereus → hydrolyse Casein producing
Clear Zones Under and around Colonies

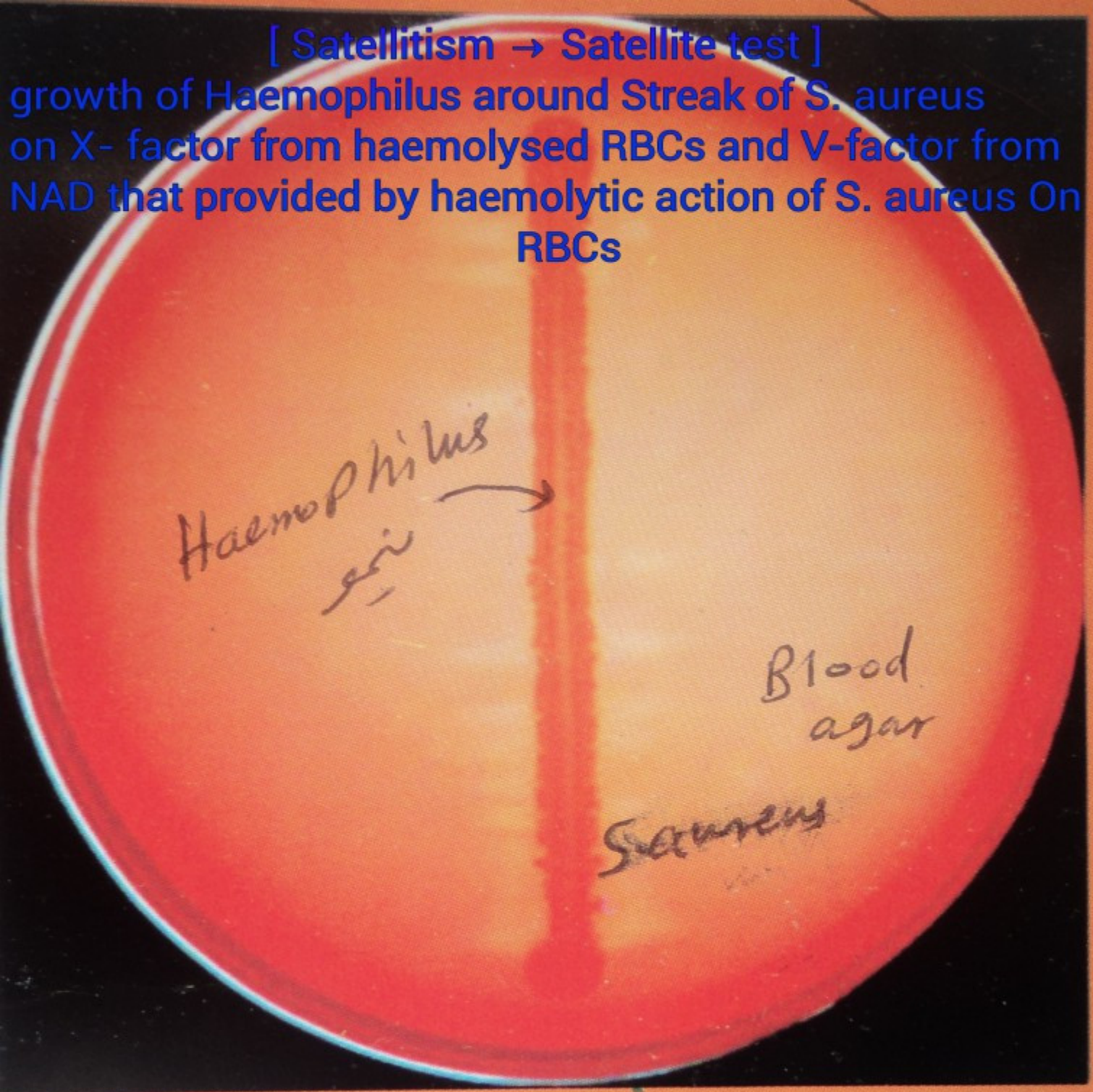

[Casein hydrolysis test]
B. Sphaericus → not hydrolyse Casein So, not produce Clear Zones Under or around Colonies

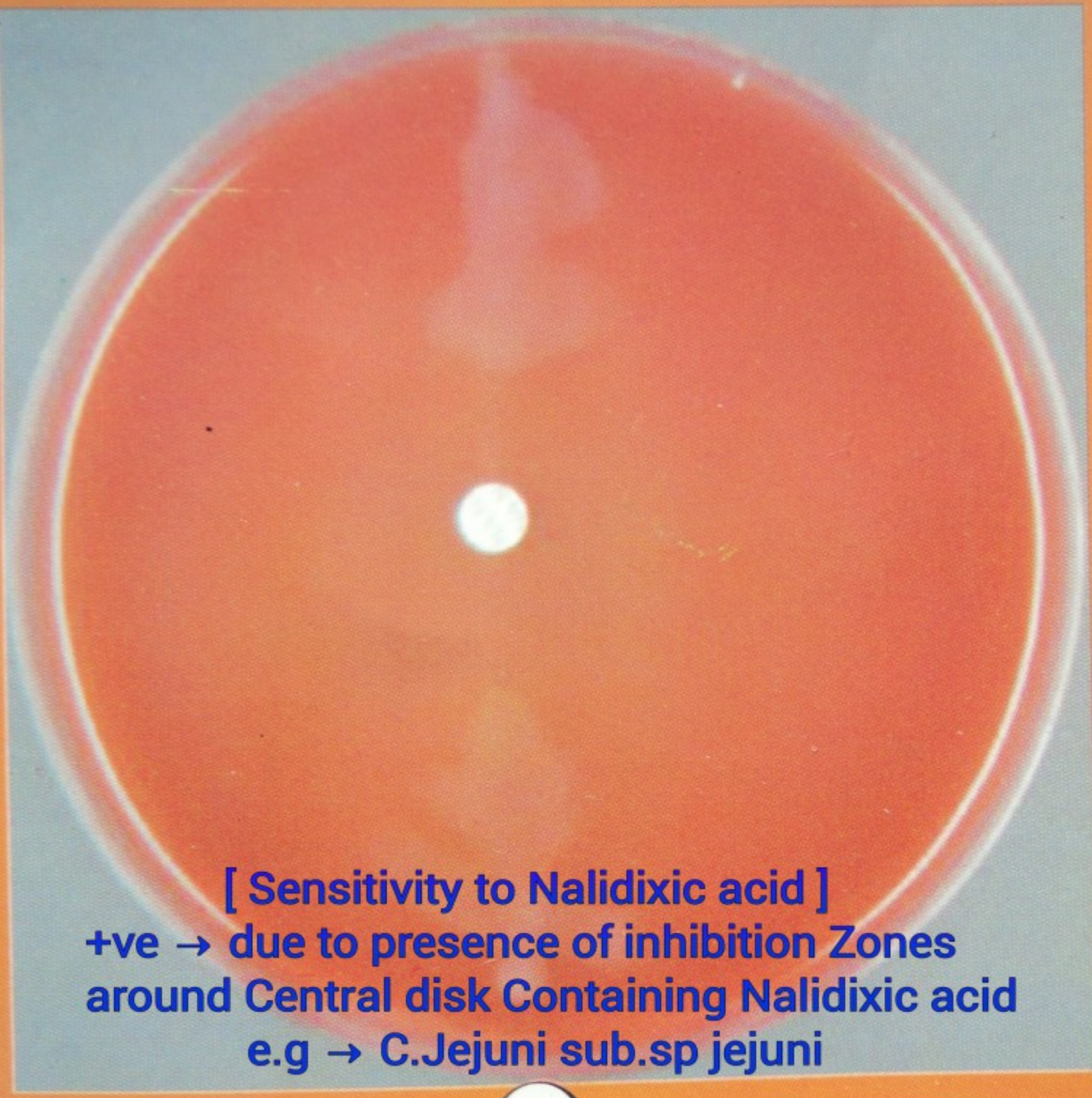
[CAMP test]

S. agalactia produce extracellular Compounds Which Conjugate with Beta haemolysin of S.aureus producing Complete haemolysis of Sheep RBCs on the Blood agar

[Satellitism → Satellite test]

growth of Haemophilus around Streak of S. aureus on X- factor from haemolysed RBCs and V-factor from NAD that provided by haemolytic action of S. aureus On RBCs





[Sensitivity to Nalidixic acid]

+ve → due to presence of inhibition Zones around Central disk Containing Nalidixic acid

e.g → C.Jejuni sub.sp jejuni

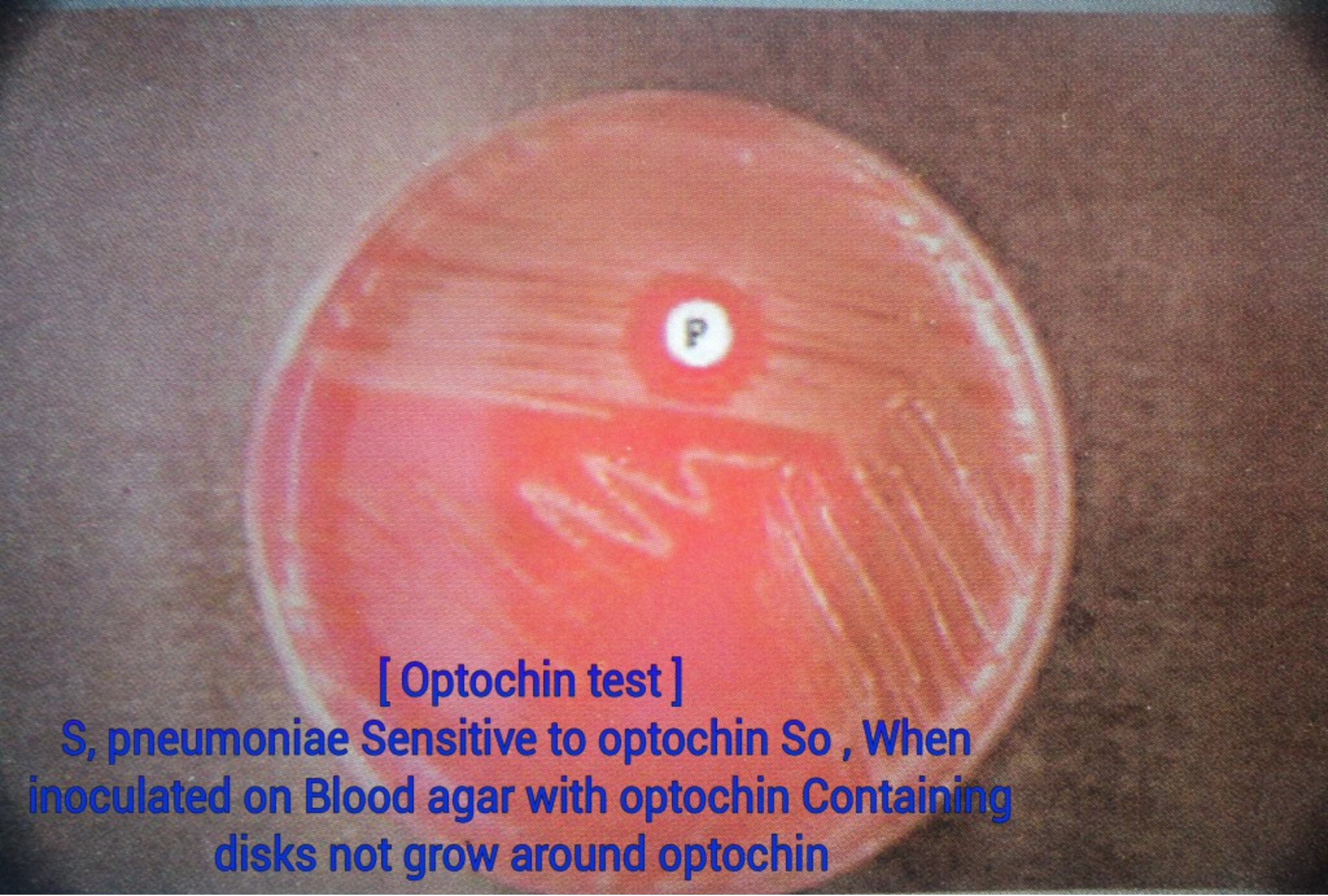
[Sensitivity to Nalidixic acid]
-ve → due to absence of inhibition Zones around Central disk Containing Nalidixic acid
e.g → C.lari

[Sensitivity to O129]

Vibrio Parahaemolyticus Sensitive to O 129

1


[sensitivity to O129]
Aeromonas hydrophila resist O129

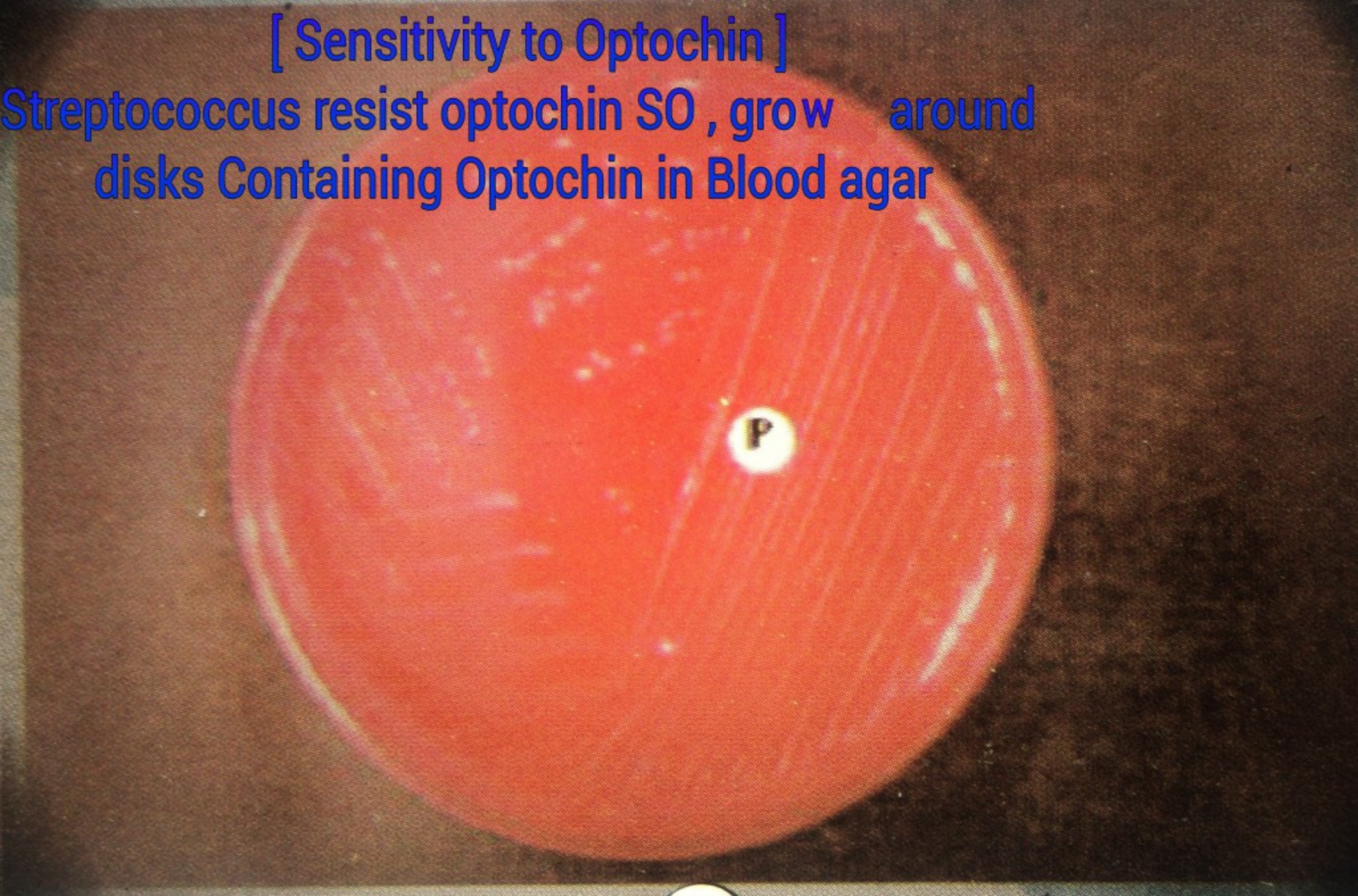


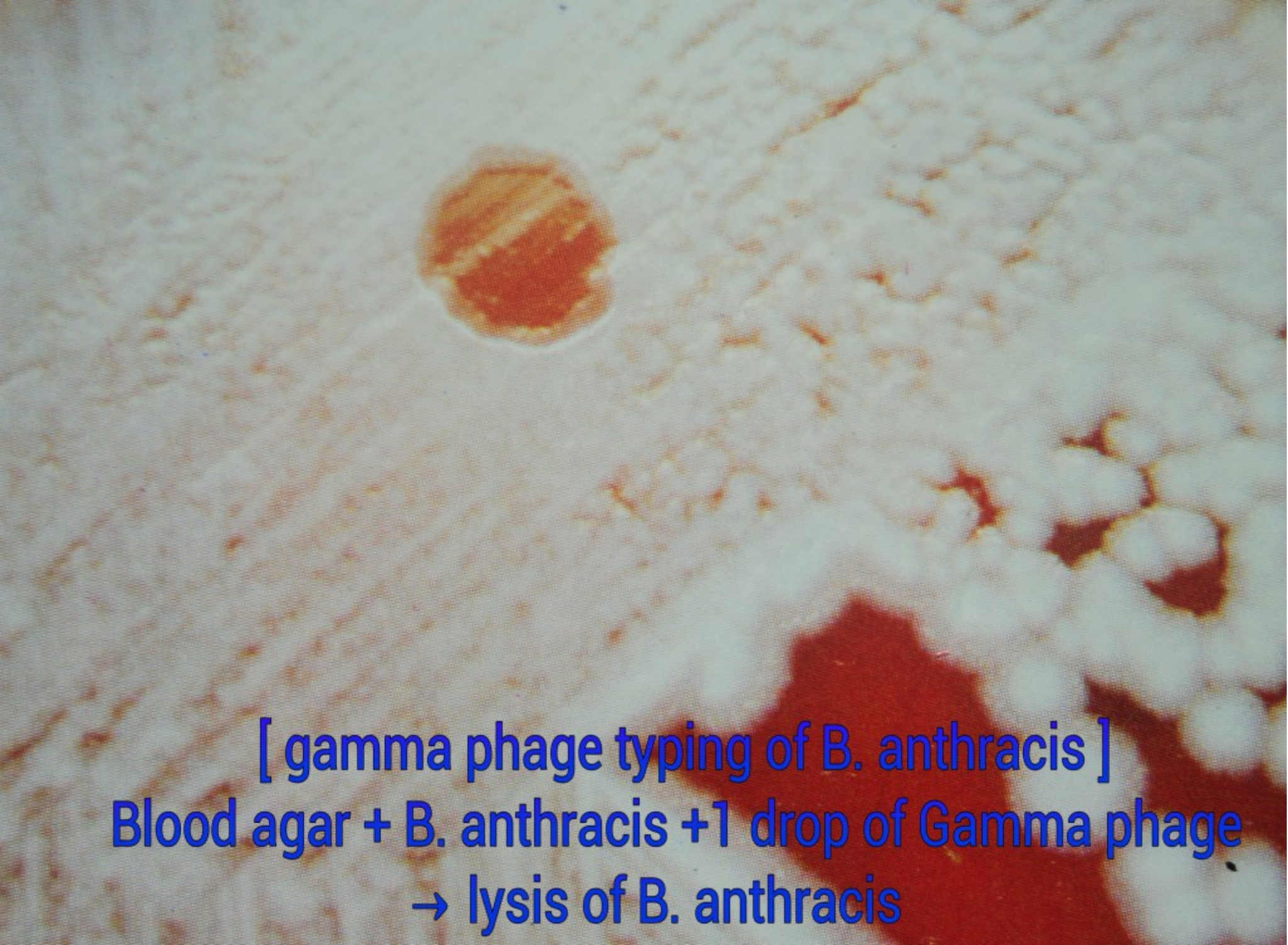
[Optochin test]

S, pneumoniae Sensitive to optochin So , When inoculated on Blood agar with optochin Containing disks not grow around optochin

[Sensitivity to Optochin]

Streptococcus resist optochin SO , grow around disks Containing Optochin in Blood agar



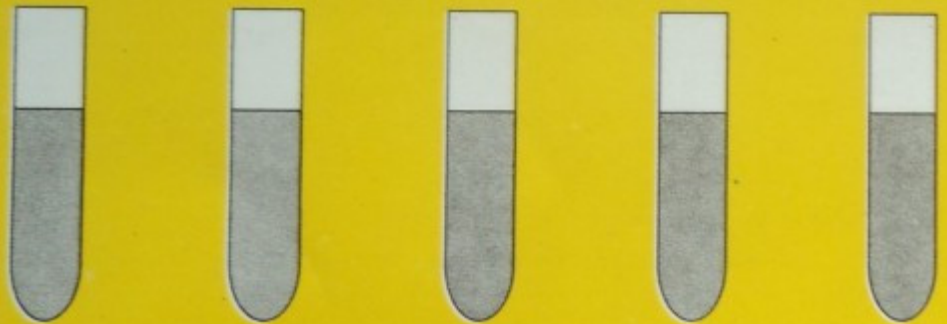


[gamma phage typing of B. anthracis]
Blood agar + B. anthracis +1 drop of Gamma phage
→ lysis of B. anthracis

[Determination of MIC to tetracycline for a tested MO]

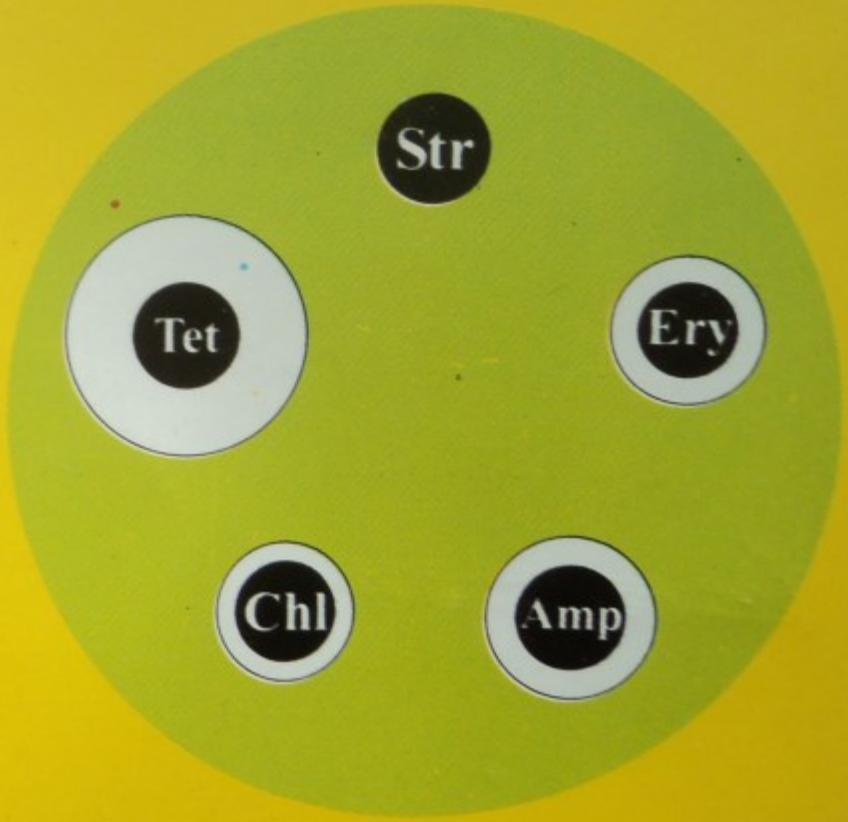
Disk Diffusion Test

Determination of MIC

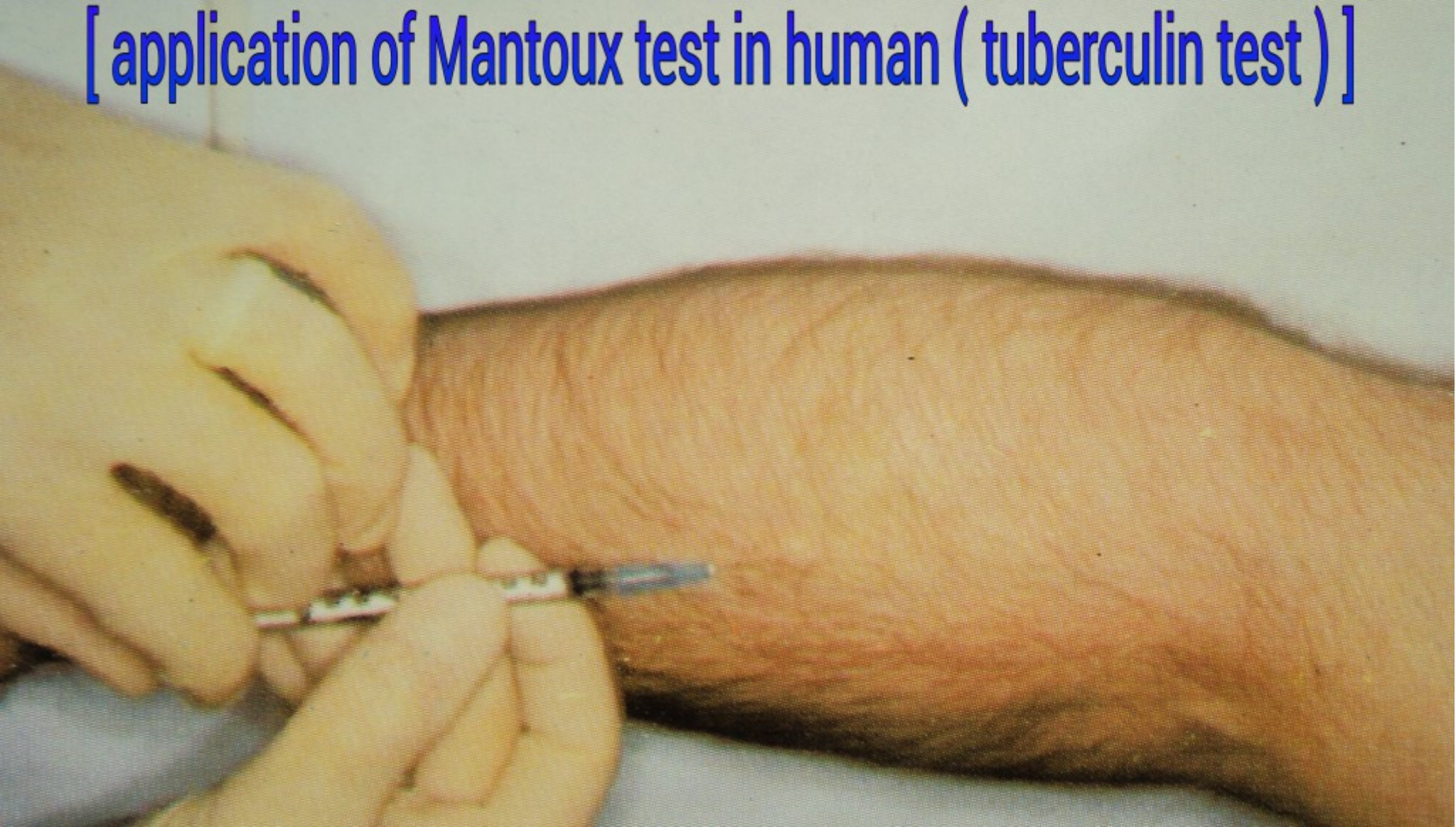


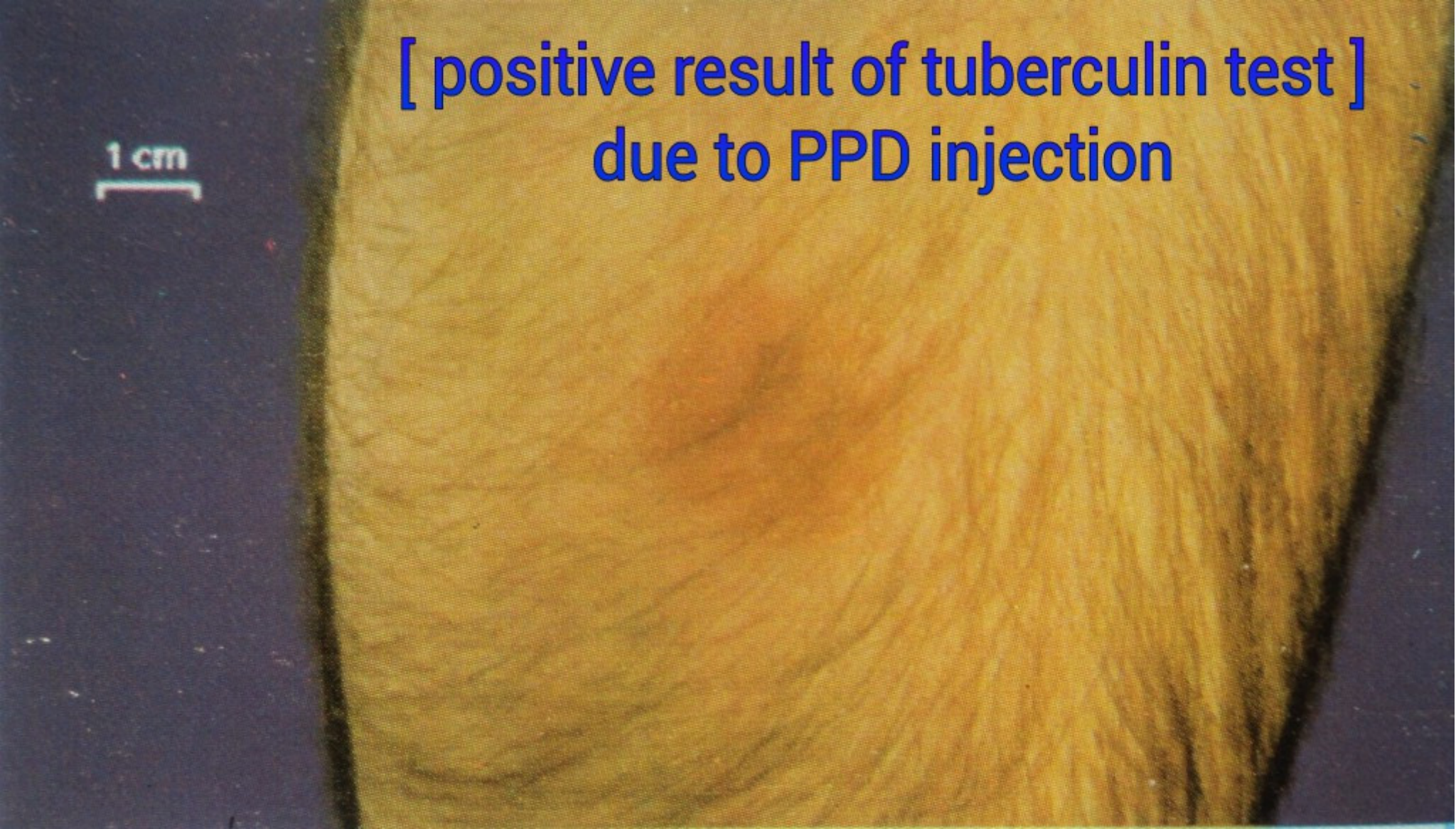
Tetracyeline (µg/ml)

MIC = 2 µg/m1



[application of Mantoux test in human (tuberculin test)]




[positive result of tuberculin test]
due to PPD injection
1 cm

[Aesculin hydrolysis test]

MO hydrolyse Aesculin into aesculetin and glucose

Aesculletin + ferric Citrate → dark brown phenolic Complex

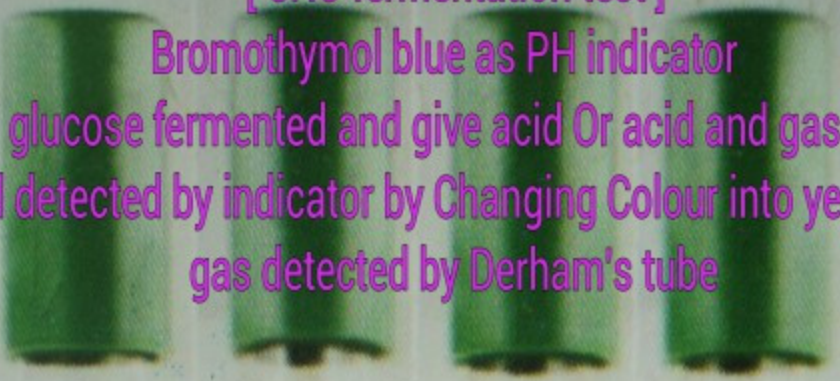
[CHO fermentation test]

Bromothymol blue as PH indicator

glucose fermented and give acid Or acid and gas

acid detected by indicator by Changing Colour into yellow

gas detected by Derham's tube

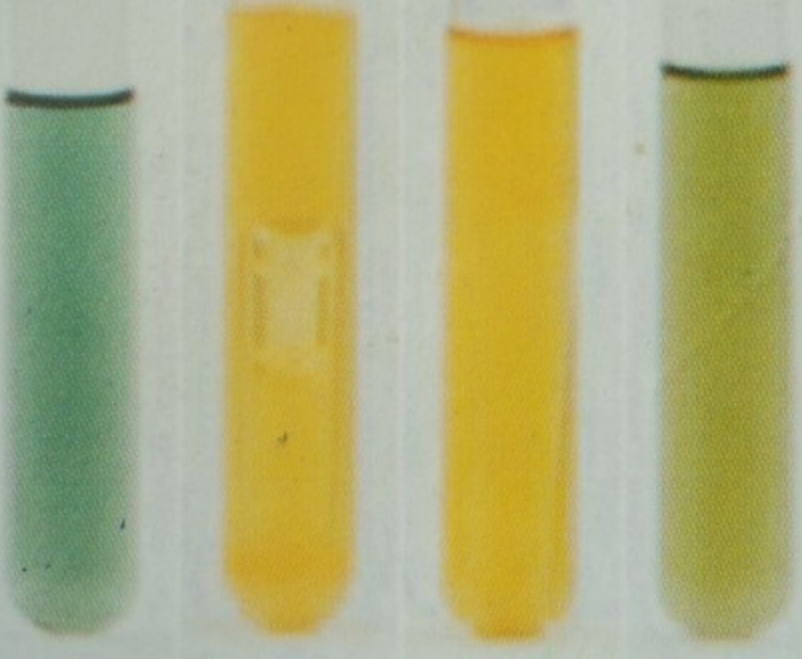


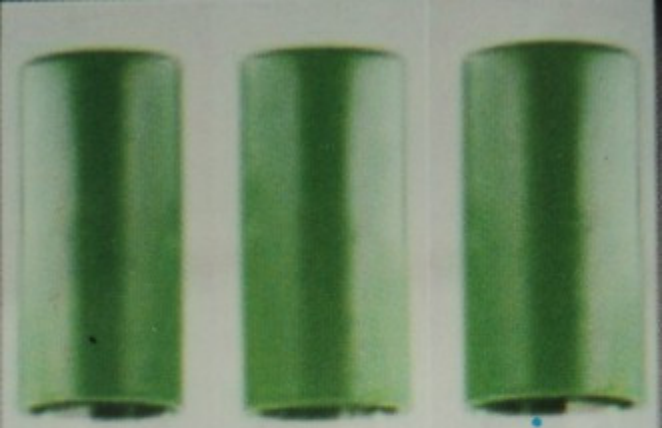
Un inoculated medium

acid

Acid and gas

negative due to growth of bacteria





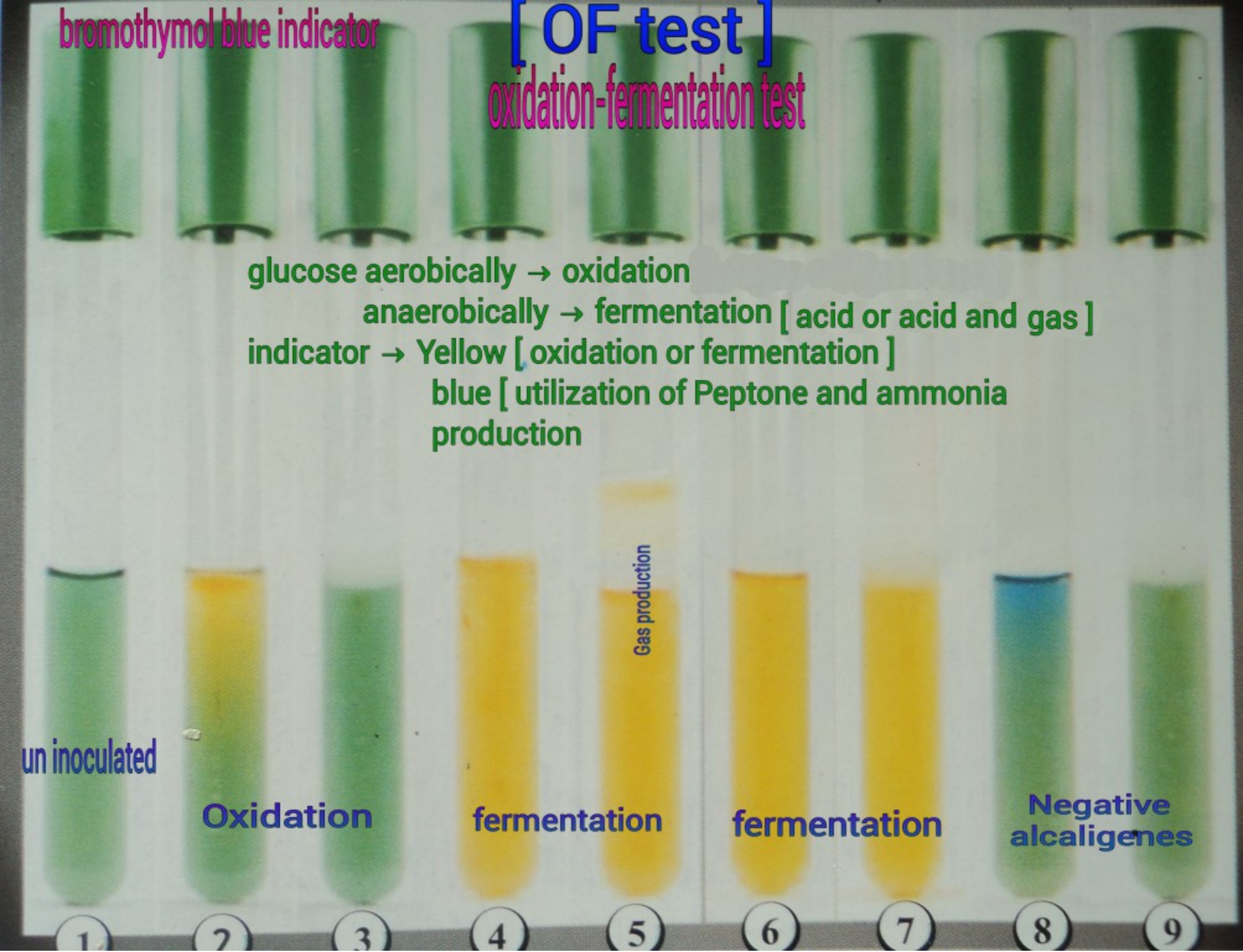
[ONPG test]

O-NitroPhenyl Beta D-galactopyranoside hydrolysed by Beta Galactosidase enzyme into O-Nitrophenol which is Yellow Colour and Galactose

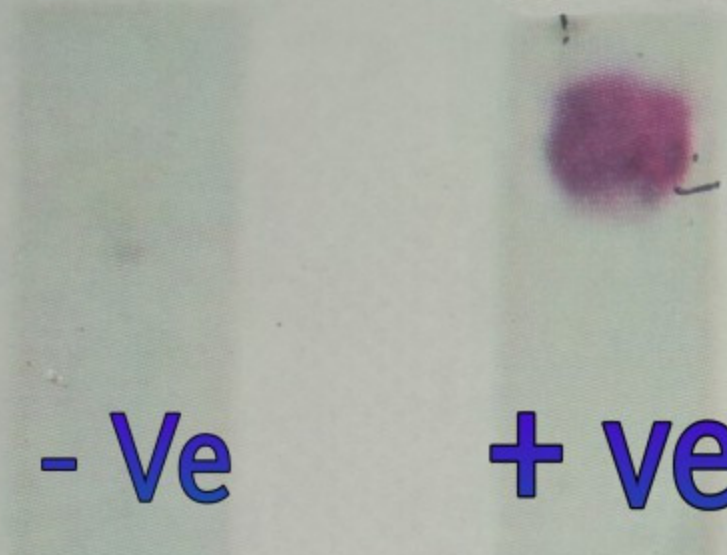
Un inoculated

positive late lactose fermenter

Negative


bromothymol blue indicator
[OF test]
oxidation-fermentation test
glucose aerobically → oxidation
anaerobically → fermentation [acid or acid and gas]
indicator → Yellow [oxidation or fermentation]
blue [utilization of Peptone and ammonia production
Gas production
un inoculated
Oxidation
fermentation
fermentation
Negative alcaligenes
1
2
3
4
5
6
7
8
9

[Oxidase test]



- Ve + ve

Korack's reagent act as artificial electron acceptor
in presence of Cytochrome Oxidase in the
suspected Colony in addition to atmospheric O2 → oxidation of
the reagent and produce indo Phenol blue [blue]
if not present → Colourless

[Deycarboxylase test]

Decarboxylation of aa lead to formation of amines make the PH alkaline

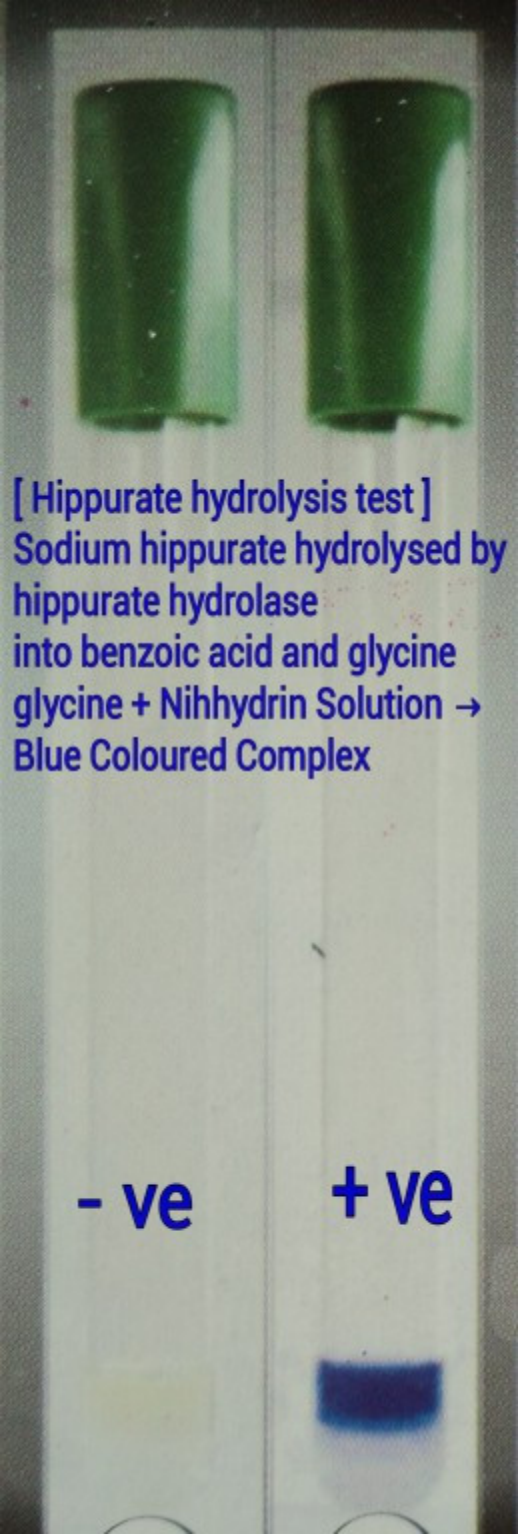
PH indicator → Bromocresol purple Cresol red

violet Colour in alkaline PH

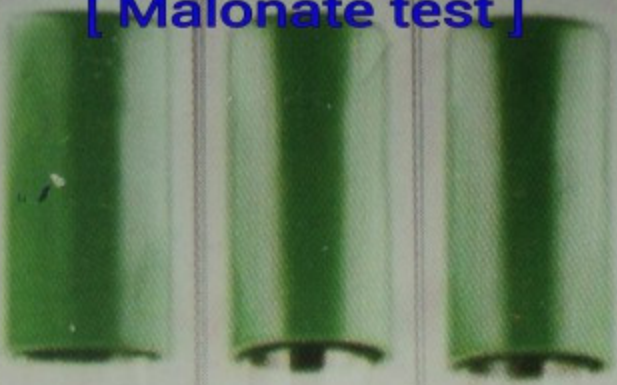
yellow Colour in acid PH

media used → Moller's medium

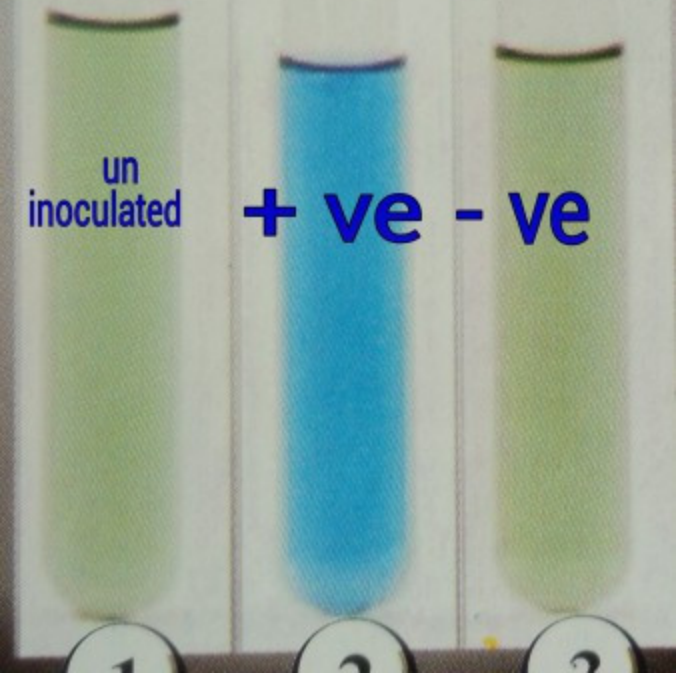

[Cimmons Citrate agar]
Citrate utilized producing alKalin PH
detected by Bromothymol blue → [blue]
un
inoculated
+ ve
- ve


[Hippurate hydrolysis test]
Sodium hippurate hydrolysed by
hippurate hydrolase
into benzoic acid and glycine
glycine + Nihhydrin Solution →
Blue Coloured Complex
- ve
+ ve

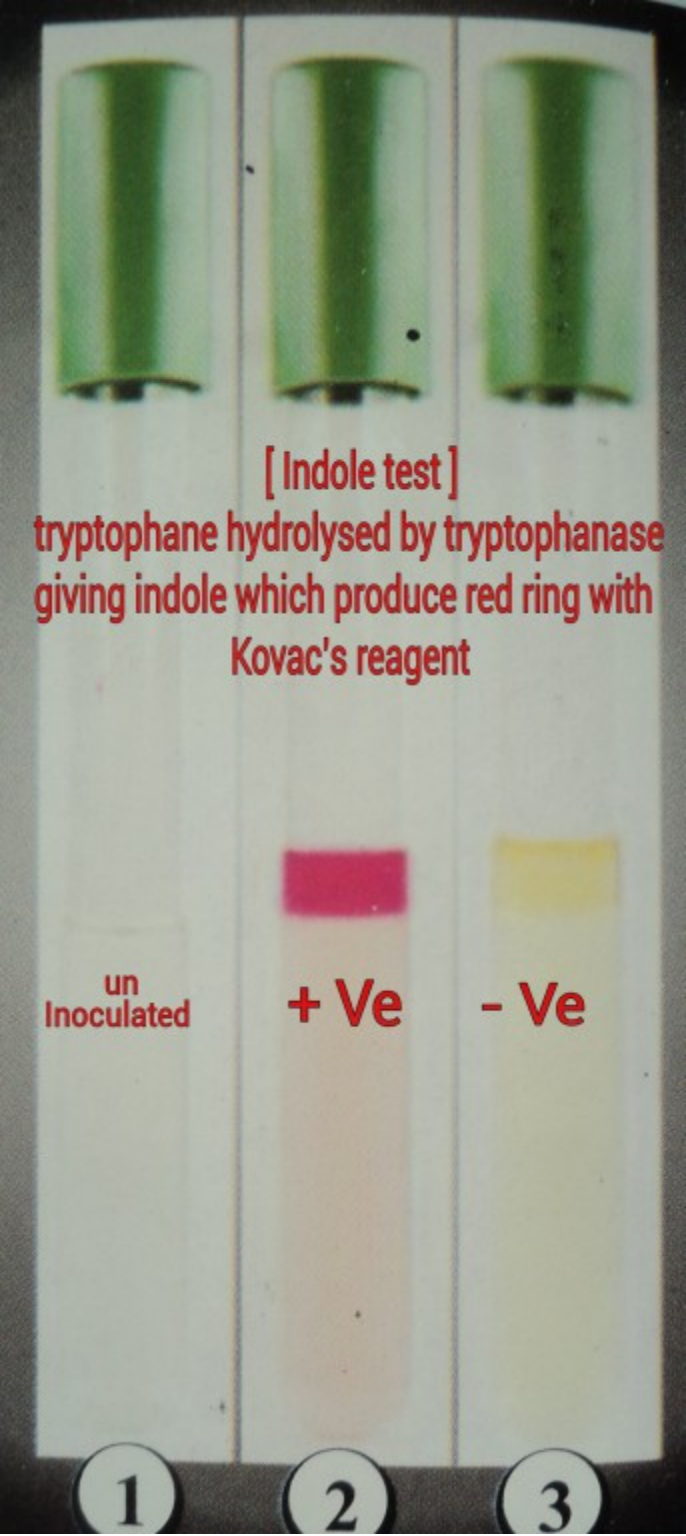
[Malonate test]

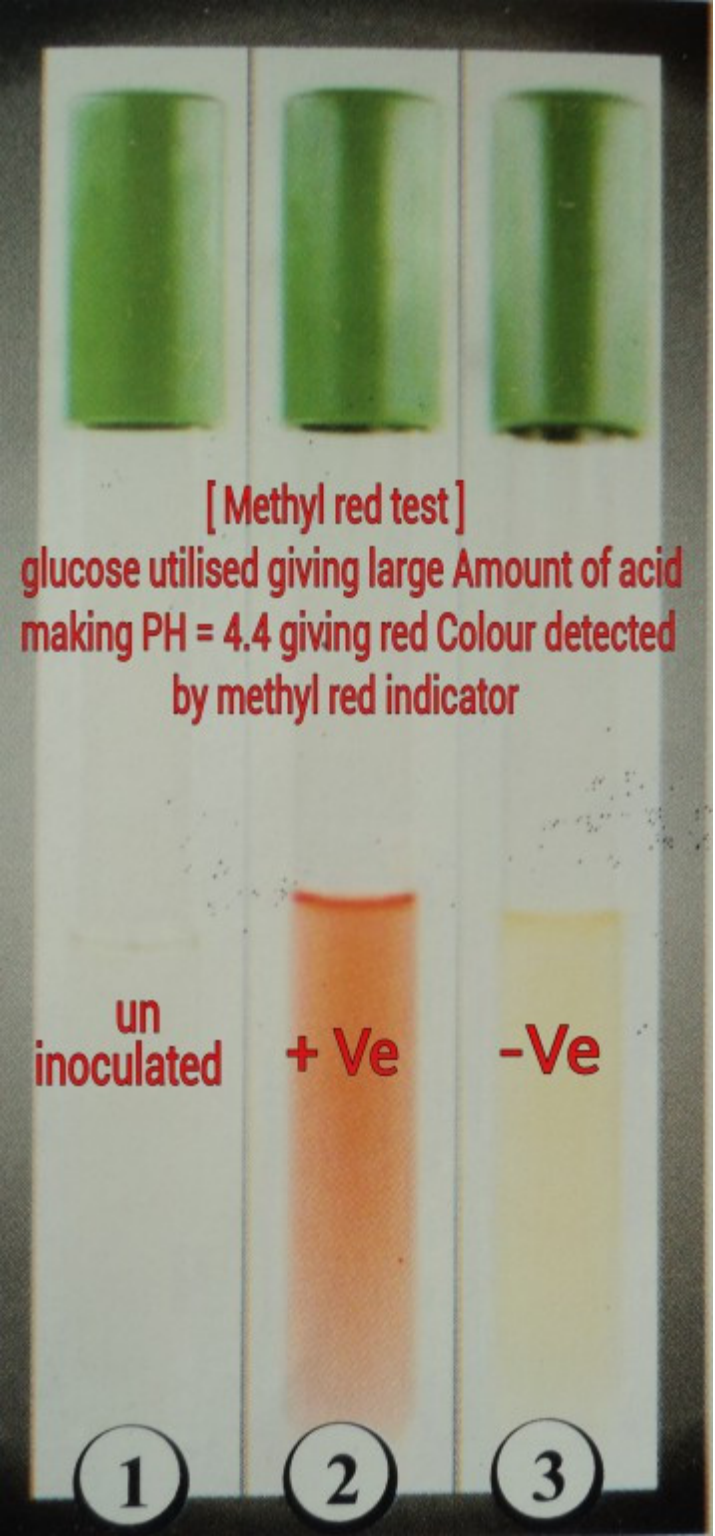


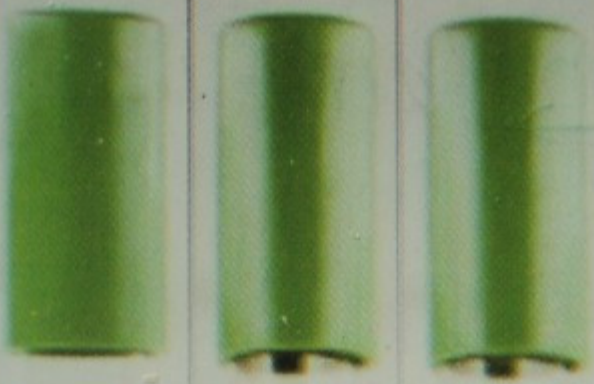
Malonate is utilised producing alkaline PH Which detected by bromothymol blue → [blue]




[Unease test]
urea utilised by Urease enzyme
producing ammonia pink Colour
with phenol red indicator
+ve
-ve
un
inoculated
1
2
3


[Indole test]
tryptophane hydrolysed by tryptophanase giving indole which produce red ring with Kovac's reagent
un Inoculated
+ Ve
- Ve
1
2
3


[Methyl red test]
glucose utilised giving large Amount of acid
making PH = 4.4 giving red Colour detected
by methyl red indicator
un
inoculated
+ Ve
-Ve
1
2
3



[Voges Proskauer test]

glucose utilised giving acid and acetyle Methyl Carbinol producing red Colour With alpha naphthol KOH

un inoculated

+ ve

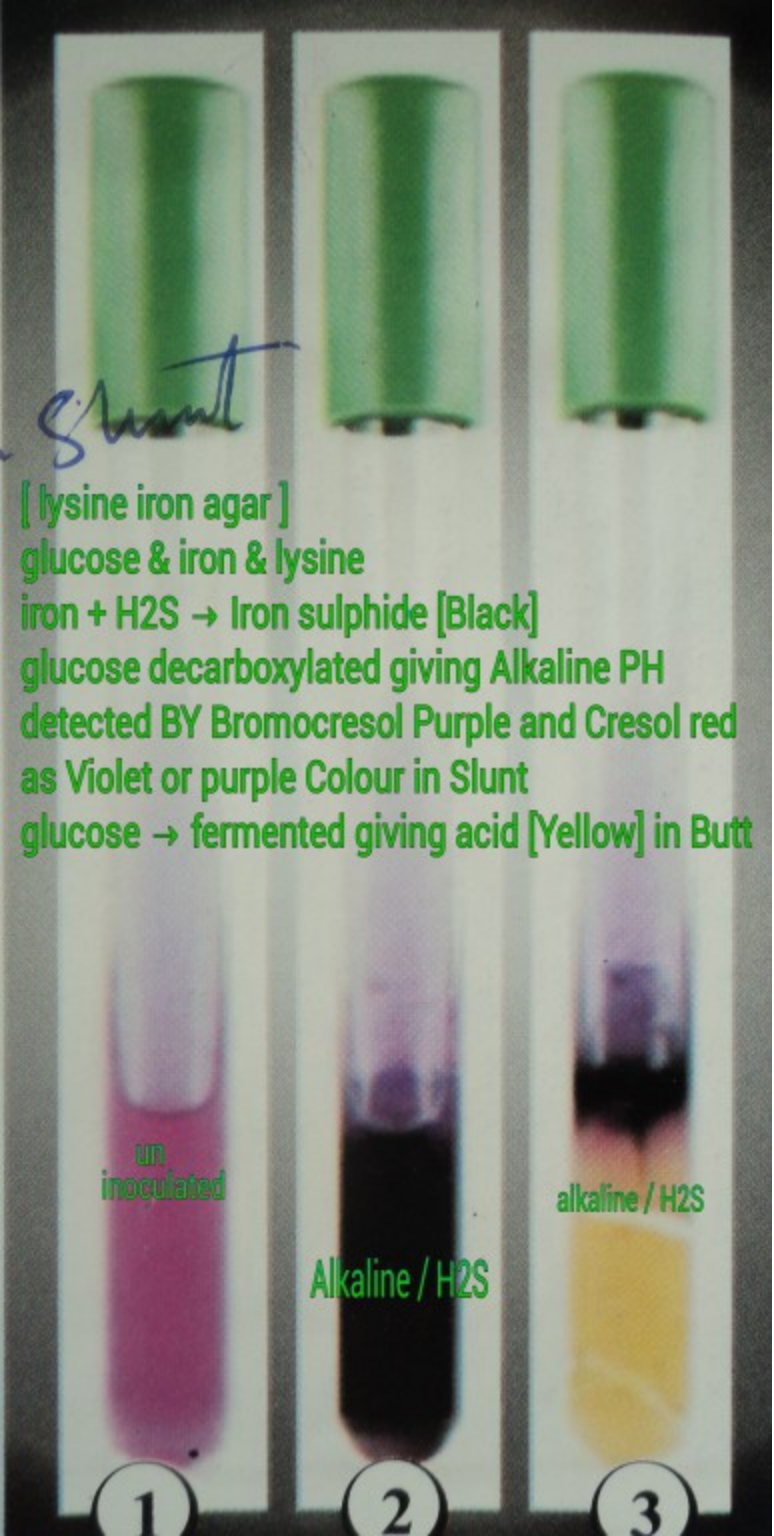
- ve

1

2

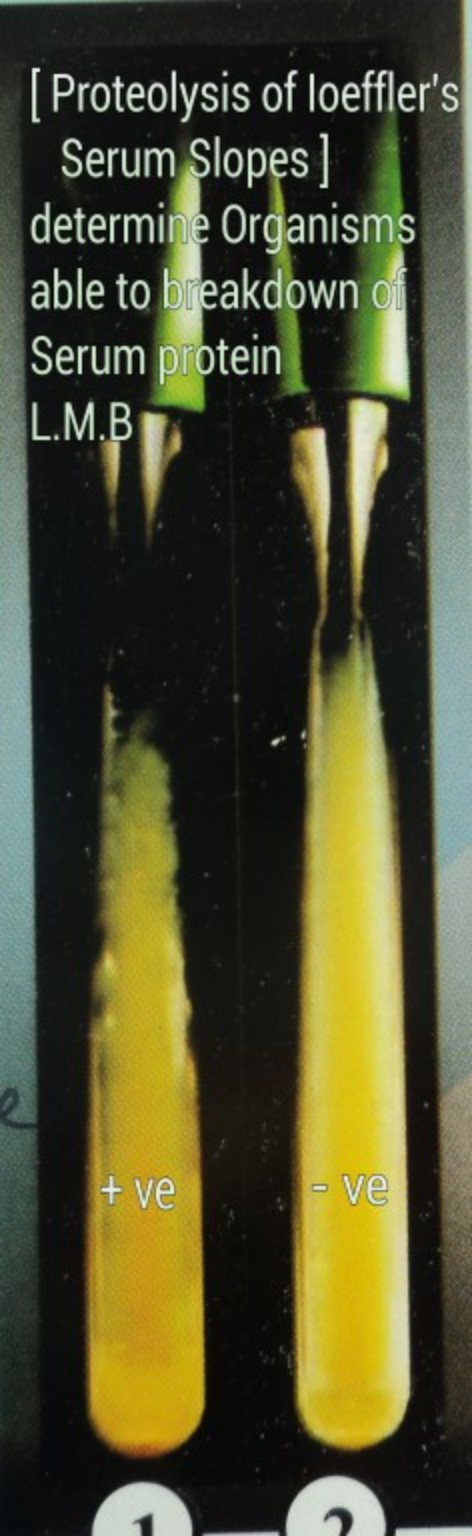
3

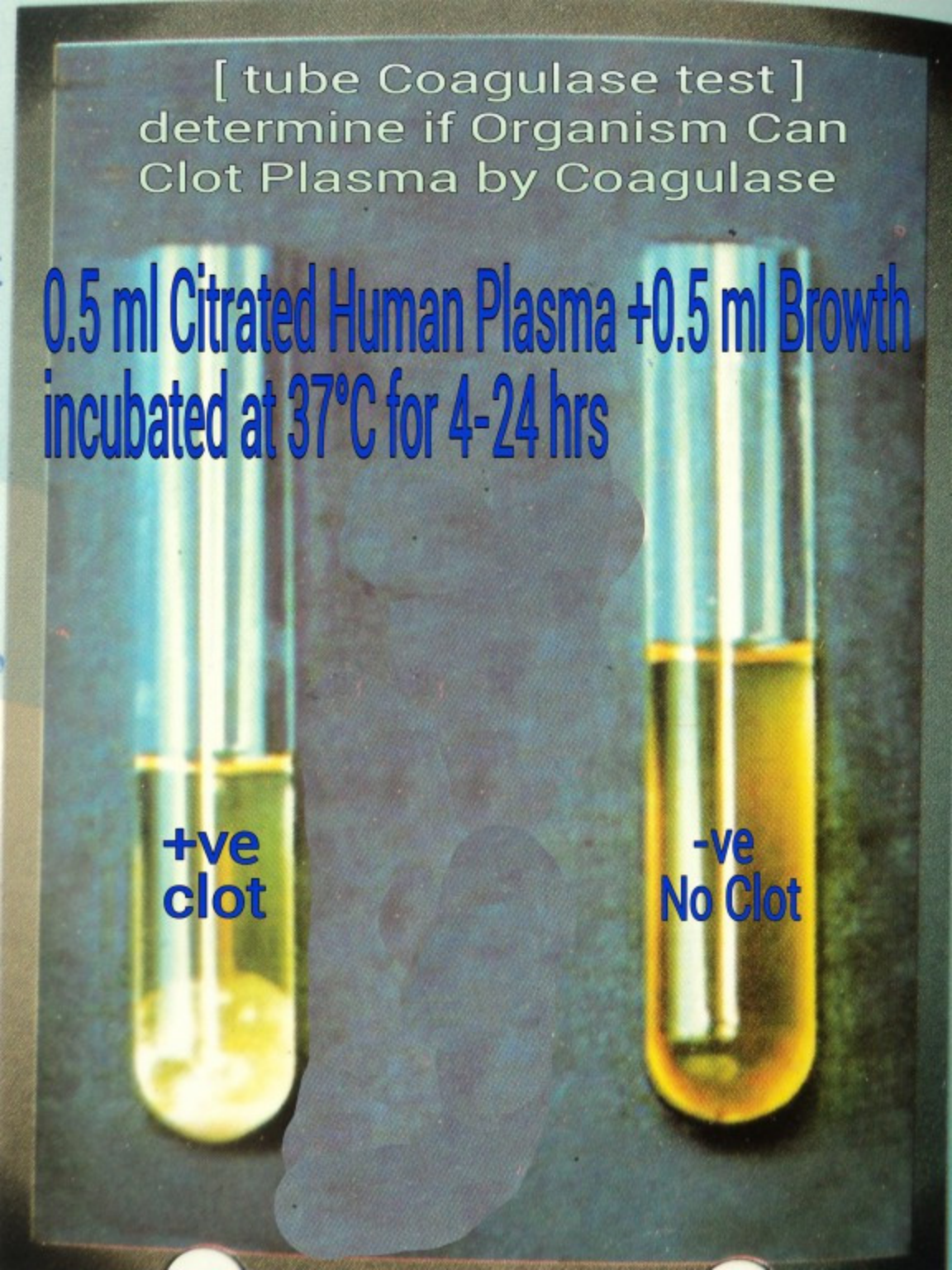

[Phenylalanine Deaminase test]
phenylalanine deaminated giving
phenylpyruvic acid + fe CL → green Colour
un
inoculated
+ ve
- ve
1
2
3

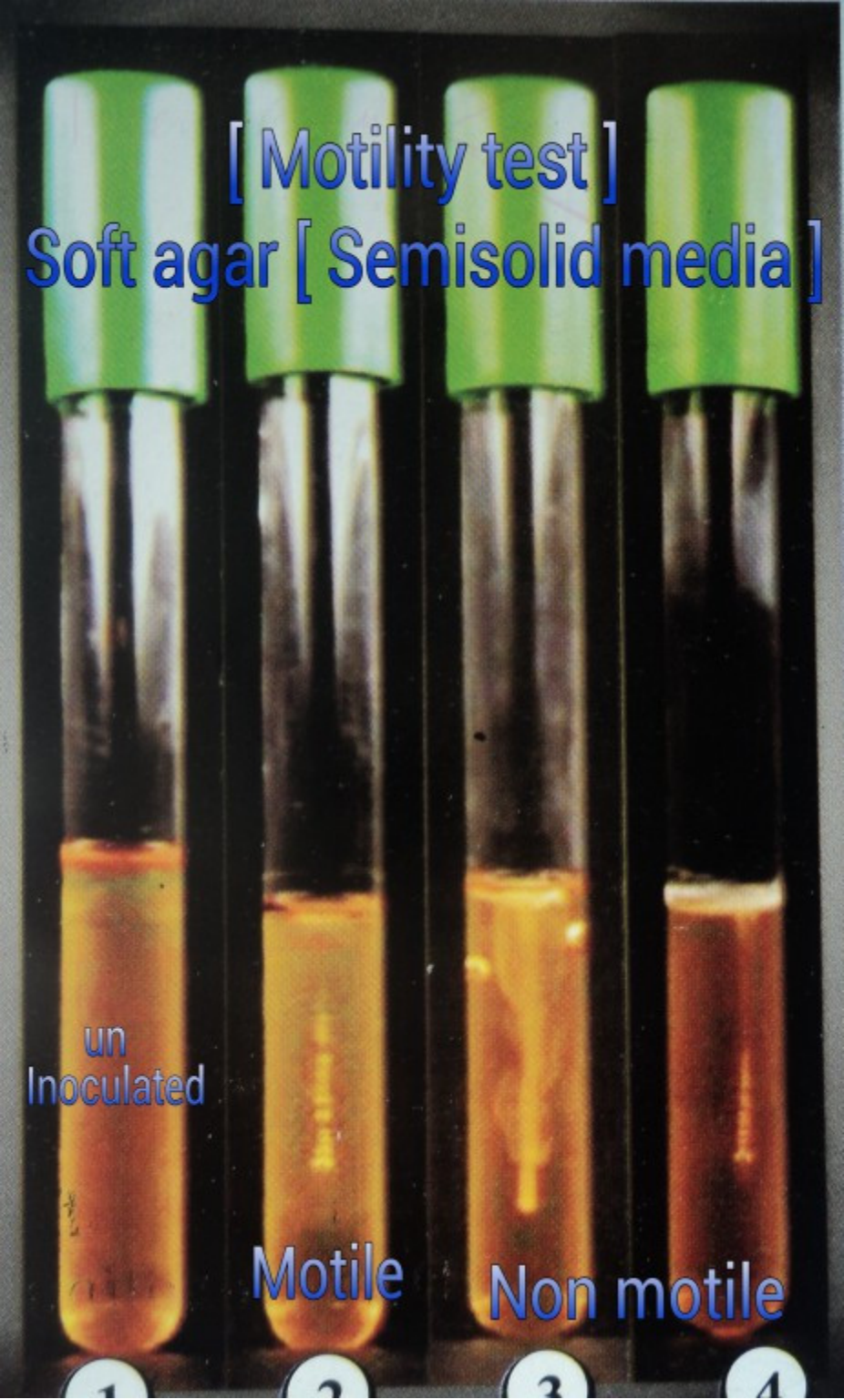

Slant
[lysine iron agar]
glucose & iron & lysine
iron + H2S → Iron sulphide [Black]
glucose decarboxylated giving Alkaline PH
detected BY Bromocresol Purple and Cresol red
as Violet or purple Colour in Slunt
glucose → fermented giving acid [Yellow] in Butt
un inoculated
Alkaline / H2S
alkaline / H2S
1
2
3


[Meta bisulphite reduction]
iron + H2S → iron Sulphide [Black]
MicroaeroPhilic MO
+ ve
- ve
un
Inoculated

[Proteolysis of loeffler's Serum Slopes]
determine Organisms able to breakdown of Serum protein
L.M.B




[tube Coagulase test]
determine if Organism Can
Clot Plasma by Coagulase
0.5 ml Citrated Human Plasma +0.5 ml Browth
incubated at 37°C for 4-24 hrs
+ve
clot
-ve
No Clot


[Motility test]
Soft agar [Semisolid media]
un
Inoculated
Motile
Non motile
1
2
3
4

[Tripple Sugar iron media] TSI agar

phenol red indicator

iron + H2S → Iron Sulphide

glucose in butt
lactose, Sucrose in Slant

Gas

No gas

1. Un inoculated

2. alkaline Slant
H2S
acid butt

3. alkaline slant
H2S
acid butt

4. alkaline butt and Slant
H2S

5. NO gas
acid Butt and Slant
H2S

6. acid Butt and Slant
gas

7. Acid butt and Slant
No gas
No H2S

8. -Ve

[Nitrate reduction test]
without gas production

Nitrate → → → Nitrite

reduction

Zink dust
orange -Ve
no reduction

Sulphanilic
acid & a napthol

Negative

Colourless after addition of Sulphanilic acid
and alpha naphthol

Un inoculated

+ Ve

[Nitrate reduction Test] with gas production

reduction of Nitrates to nitrites and reduction of nitrites to free N2 in → right tube

→ Vaslein

↓

N2

-Ve

+ ve


Test
Control
growth on Broth Containing 6.5% Nacl
turbidity


Test
Control
→ No turbidity
No growth On Broth Containing 6.5 % Nacl